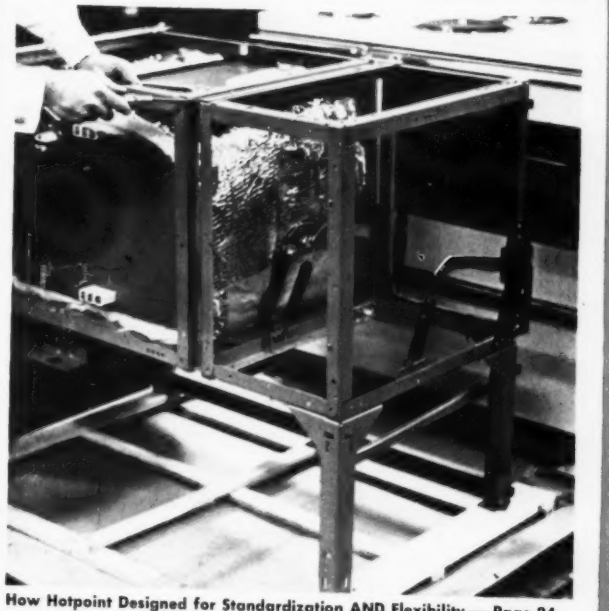
DETROIT PUBLIC LIBRARY
TECHNOLOGY DEPARTMENT
Detroit Public Library 5 4
Technology Dept.
96 Putnam Ave.
Detroit 2, Mich.

METAL PRODUCTS MANUFACTURING

MPM

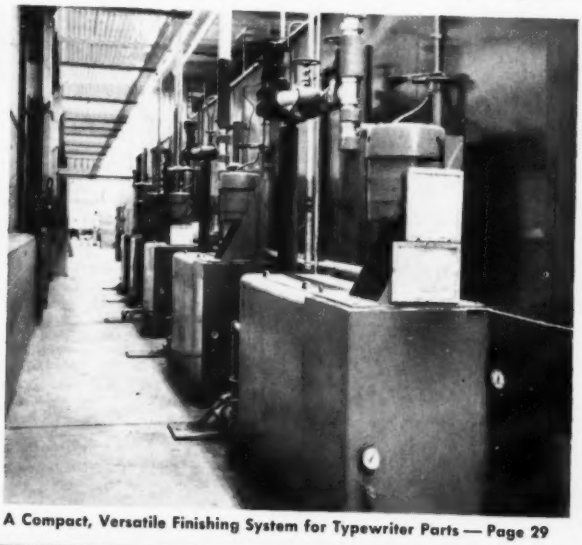
Serving the Appliance and Fabricated Metal Products Industry

JULY 1961



How Hotpoint Designed for Standardization AND Flexibility — Page 24

Streamlines Spare Parts Distribution — Page 43



A Compact, Versatile Finishing System for Typewriter Parts — Page 29

Here is why your next O.B.I. should be a Clearing

Vastly Improved Clutch and Brake Unit

An oil-immersed clutch and brake that's "built to be forgotten". This improved air-friction clutch and brake unit never requires adjustment. Wear is so negligible as to be virtually non-existent.

"Clearelease" Unsticking Mechanism

In the event of a jam where the press slide is stuck on bottom, "Clearelease" makes it possible to release the jam, be back in operation in minutes.

All Steel, Enclosed Design

Clean, space-saving design improves safety. Flywheel and moving parts are completely enclosed. Rigid all steel frame resists deflection, prolongs working life of expensive dies.

Micrometer Precise Slide Adjustment

A fine adjustment setting for unusually accurate slide positioning has been newly designed. Adjustment also contains a lock which holds the slide rigidly at the desired setting.

Complete Electrical Controls... Shock Mounted

Your Clearing O.B.I. will have operator's control buttons and master control panel, wired-in and in place when shipped. Five position selector switch is key-locked.

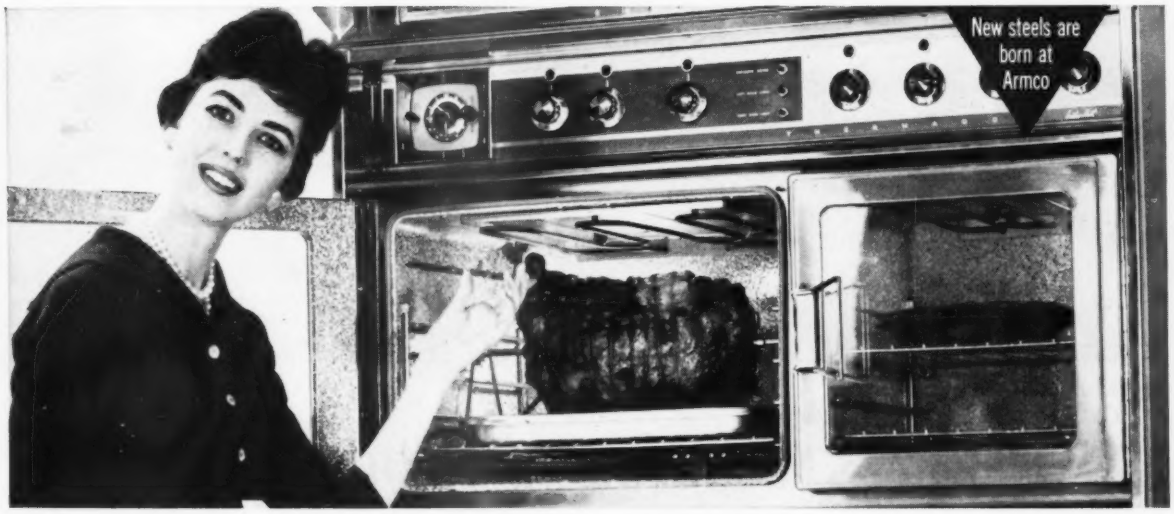
Get the Facts on the many carefully engineered features of Clearing's line of O.B.I. presses—22, 32, 45 and 60 tons capacity.

usi **Clearing**

DIVISION OF U. S. INDUSTRIES, INC.
6499 W. 65th Street • Chicago 38, Illinois

Circle No. 311 on Reader Service Card.

She Wants Efficiency....
Provide It Economically with Armco ALUMINIZED STEEL



Housewives look for cost-saving and time-saving efficiency in the appliances they buy. You can provide this sales advantage *economically* by using Armco ALUMINIZED STEEL for heat reflectivity in your appliances. This special aluminum-coated steel bounces back up to 80 per cent of radiant heat, yet costs less than other materials to do the same job.

ALUMINIZED STEEL is extra strong—too. It usually does double duty, serving as a structural part as well as a reflector. For more information on how this economical two-in-one metal can put more sell into your appliances, just write **Armco Steel Corporation, 1121 Curtis Street, Middletown, Ohio.**

Steel

Capitalize on high customer acceptance of steel; put the distinctive Steelmark on the products you make.

ARMCO **Armco Division**

Circle No. 304 on Reader Service Card.

THE *far-sighted* APPROACH TO STRIPPERS IS KERNS

Naturally . . . in production you look ahead to be ahead. When it comes to stripping operations, Kerns United can plan ahead for you by recommending a paint stripper that really strips, one that is tailored specifically to your needs. Working with Kerns is real *foresight* because Kerns recommendations are positive . . . they offer you guaranteed results with lowest over-all cost . . . Let us prove it. Take advantage of Kerns Memo Billing Trial Basis . . . no formal invoice rendered unless proven in production. *Manufacturers of* Cutting, Grinding, Drawing, Forging, Phosphatizing, Cleaning, Wire Drawing and Spray Booth Compounds; Rolling Oils, Rust Preventives, Cling Oils and Specialized Greases.

World's largest Exclusive Manufacturer of Specialized Industrial Lubricants.

KERNS UNITED Corporation

2659 East 95th Street • Chicago 17, Illinois

Subsidiary: KERNS PACIFIC Corporation, *630 N. Batavia St., Orange, California*

Offices in Principal Cities throughout the U.S.A.

for the best in paint strippers— look to **KERNS**

MAIL COUPON TODAY

Please check and return to Kerns United Corporation

- ☐ *Bulletin "How to get the most out of Paint Strippers"*
- ☐ *Details on Kerns Memo Billing Trial Basis*
- ☐ *Have representative call for further discussion*

NAME_____ TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

JULY • 1961
VOL. 18 • NO. 7

MPM

(including finish)

MONTHLY TRADE PUBLICATION
Established January 1944
Published by
DANA CHASE PUBLICATIONS, INC.
York Street at Park Avenue, Elmhurst, Illinois
Telephone • TErrace 4-5280 • TErrace 4-5281

FEATURES

Page

GOLDIN RE-ELECTED IAM PRESIDENT
MPM staff report on 29th annual IAM meeting 16

HOW HOTPOINT DESIGNED FOR STANDARDIZATION AND FLEXIBILITY
C-frame construction allows varied range designs 24

A COMPACT, VERSATILE FINISHING SYSTEM FOR TYPEWRITER PARTS
painting and plating at Royal McBee 29

COORDINATING QUALITY CONTROL FOR 12 PLANTS
system in use throughout Home Products Div. of Rheem 31

HOW KAISER REDUCED BATHTUB SCRAP FROM 7 TO 1 PERCENT
new drawing technique effects significant savings 34

A SIMPLE METHOD FOR ELIMINATING SOLDERING FLUX CORROSION FROM STAINLESS STEEL PRODUCTS
simple tools solve a pesty problem 36

GE STREAMLINES SPARE PARTS DISTRIBUTION
55,000 different parts stocked at New Concord facility 43

CLEANING HOME AIR ELECTRONICALLY
new Honeywell unit designed for ductwork installation 46

WORLD'S LARGEST FURNACE FOR WATER HEATER TANKS
new equipment fires glass-lined tanks at A. O. Smith 48

THERMOSETTING ACRYLICS
a followup to thermosetting acrylic survey story in May MPM 81

DEPARTMENTS

7 FINISH LINE
13 NEWSQUOTES
14 EDITOR'S MAIL
53 PERSONALS
57 NEW PRODUCTS
61 NEW LITERATURE
63 READER SERVICE
65 INDUSTRY NEWS
67 STATISTICS
71 COMING FEATURES
77 INDUSTRY MEETINGS
79 SAFE TRANSIT NEWS
82 ADVERTISERS' INDEX & CLASSIFIED

METAL PRODUCTS MANUFACTURING

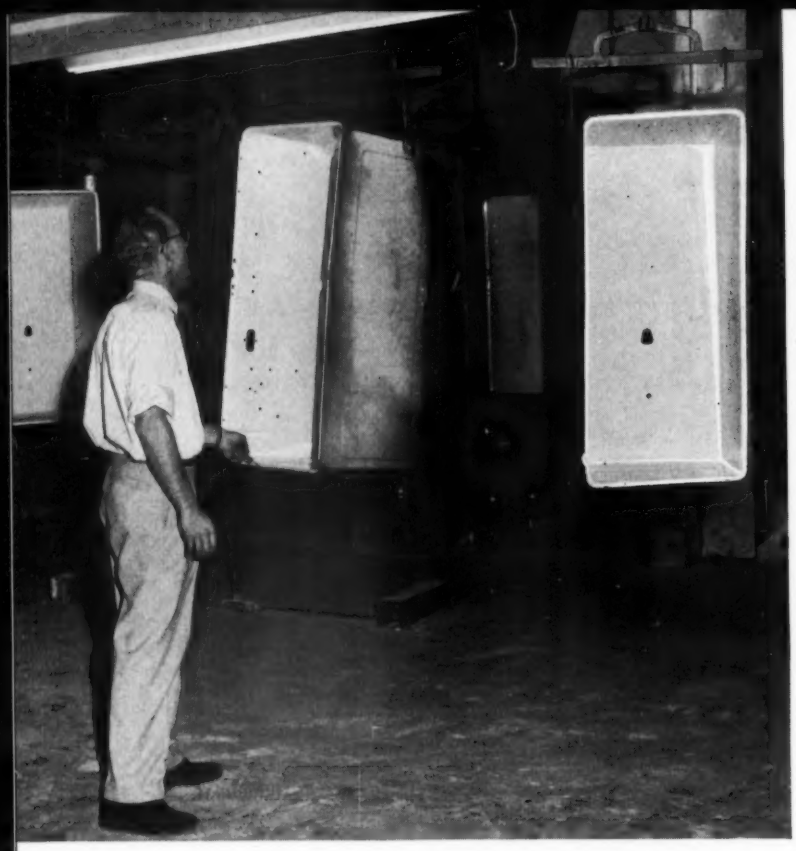
FROM RAW METAL TO FINISHED PRODUCT

A trade publication devoted to the interests of the metal products manufacturing industry with special editorial attention to home appliances. The editorial scope covers design, engineering, market and statistical information and technical and practical information on plant facilities and all phases of manufacturing "from raw metal to finished product." Free controlled circulation to top management, sales management, purchasing, engineering and key plant management and supervision in metal product manufacturing plants. To others, subscription price is $10.00 per year, domestic. To all other countries $15.00 per year (U.S. funds). Single copies, $1.00.

COPYRIGHT © 1961
DANA CHASE PUBLICATIONS, INC.
PRINTED IN U.S.A.

Accepted as a controlled circulation publication at Aurora, Illinois.

Editor and Publisher • DANA CHASE
Associate Editor • WM. N. LARSEN
Associate Editor • RAY SCHUSTER
Publisher's Assistant • DOROTHEA C. MEEKER
Circulation Manager • KATHRYN BANCROFT
Mgr. Customer Service • DANA CHASE, JR.
Customer Service • CAROL KLEPPIN
Customer Service • R. F. KENDIG
Customer Service • WILLIAM S. HAYES
Customer Service • RUSSELL W. MADDOX
Advertising Production • MARIE RUBIETTA



Direct-on enameled food liners pass the watchful eye of an inspector as they leave oven. Direct-coated Bethnamel food liners, which comprise some 75 pct of plant's output, have eliminated corner brushing. They are free from fishscaling, boiling, and gassing defects.

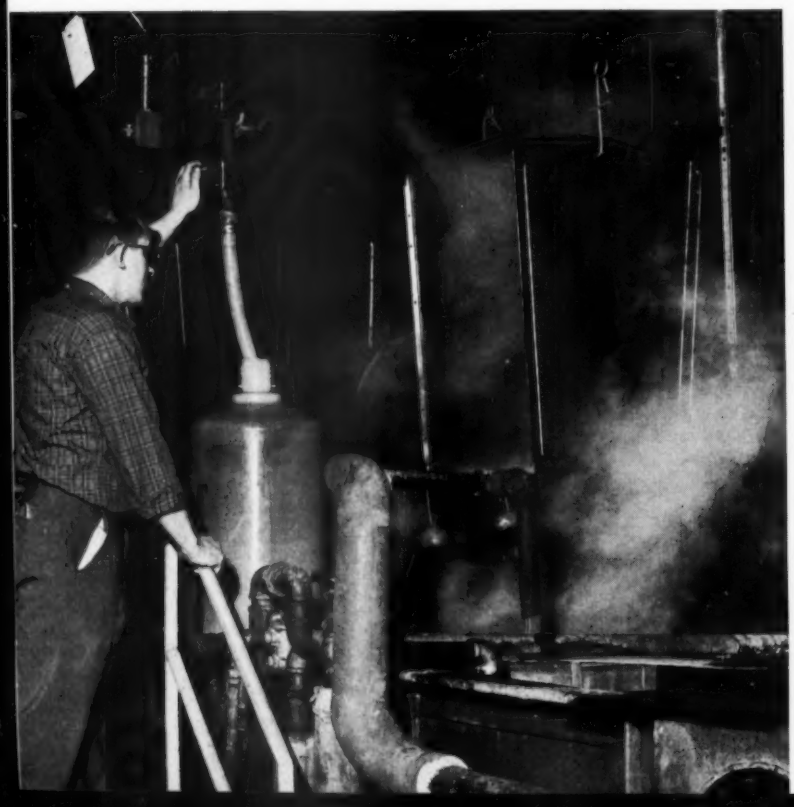
Finished refrigerator shows direct-coated liner and crisper pan in place. Westinghouse also considers Bethnamel a top-quality sheet even for parts that have to be two-coated. And there's no cost penalty—the price is the same as for conventional enameling iron.

Steel

for Strength
. . . Economy
. . . Versatility

Here you see sulphuric acid being added to ferric sulphate pickle solution, to maintain an operating pH limit of 1.3 (±.1). The metal removal is controlled at about 2 gr per sq ft. Bethnamel performs well in this bath.

After the acid bath and rinse, the liners enter a nickel flash in de-ionized water. Westinghouse aims at a nickel deposit of .1 gr per sq ft minimum. Here the pH runs about 3.0 to 3.1.



How Westinghouse uses Bethnamel in direct-on porcelain-enamel process

Here's how Bethnamel... ***Cuts work-processing time • Lowers enameling costs • Improves finished product***

Westinghouse was one of the first to do extensive plant work in the development of the direct-on finish process for production runs of porcelain enameled products. They were quick to take advantage of the almost-zero carbon content of Bethnamel, the new porcelain enameling sheet developed by Bethlehem.

They Use Ferric Sulphate-Sulphuric Acid Pickle

At their Columbus, Ohio, plant, Westinghouse is now using Bethnamel in production of refrigerator food compartments and crisper pans. They prepare the Bethnamel steel surface for excellent adherence and appearance by a metal preparation system developed in the laboratories of a frit maker. This involves a ferric sulphate-sulphuric acid pickling process.

Enamel used at Columbus plant was chosen on basis of resistance to crazing at food-liner corners. After the spray operation, it is fired at 1525 deg F in a 64-ft hot zone at line speed of 22 feet per minute.

Enameling Time Cut by 25 per cent

Results have equalled or bettered those obtained in the conventional ground-and-cover-coat system. Bethnamel's negligible carbon content eliminated boiling and fishscaling problems. Work processing time has been reduced about 25 pct during the enameling operation, and enameling costs were significantly lowered through elimination of the ground coat. Westinghouse has found that Bethnamel welds much more uniformly than enameling iron.

May we send you Folder 734?

Bethnamel's superior performance in the porcelain enameling of a wide variety of products has established this remarkable sheet as the new standard of the industry. You can enjoy Bethnamel's advantages at a cost no higher than that of ordinary enameling iron. Let us send you Folder 734. Ask our nearest sales office or write direct to us at Bethlehem, Pa.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Sales: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

Circle No. 305 on Reader Service Card.

are you one of the many plants who are already using CV500-T ?

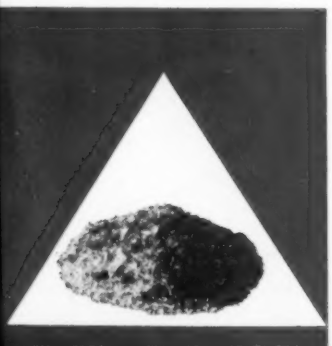
THE EXCLUSIVE, NEW CHICAGO VITREOUS

TITANIUM WHITE

Desirable for Direct-On as well as for Conventional Enameling

TALK IT OVER WITH YOUR CHICAGO VITREOUS REPRESENTATIVE

HE'LL SHOW YOU THE COST ADVANTAGES THAT CV 500-T OFFER YOU



THAT'S 10 WAYS BETTER

1. unheard-of color stability* over firing range 2. class a acid resistance 3. exceptionally high alkali resistance 4. incomparable re-fire stability 5. spot sprayability with no visible color change 6. excellent sulphate pit resistance 7. fires at low temperature 8. low stress 9. meets nema white color 10. excellent workability

Desirable for Direct-On as well as for Conventional Enameling

*Patent Pending

FOR FINEST FRIT—CHICAGO VIT

Chicago Vitreous CORPORATION

A Division of The Eagle-Picher Company

1425 S. 55th Court, Cicero 50, Illinois

Circle No. 310 on Reader Service Card.

HEAT PUMPS AND ROOM AIR CONDITIONERS

. . . find one of their best markets in Florida. The opportunity, however, is not without its responsibilities and hazards. This was pointed out in the Finish Line editorial for May 1960, which read in part:

"At a Pompano Beach address, there are 18 room-type air conditioning units, of which 10 are the reverse-cycle type for cooling-heating.

"Nine one-ton reverse-cycle units were put in service in January 1957. Eight one-ton units for cooling only, and one three-quarter-ton reverse-cycle unit, were placed in service in 1958."

The owner reported: "Of the reverse-cycle models in use, four have to date required replacement of units — (within the five-year warranty period). *The replacement requirement for fan motors averages one per year for each unit in use.*"

A manufacturer responds

A short time following the appearance of the May 1960 editorial, we received word from Frigidaire that this GM subsidiary had designed and was producing a unit specifically engineered to withstand the corrosive atmosphere of Florida and similar areas. MPM published a design feature in the November 1960 issue on Frigidaire's "Saltaire Tuffy" room air conditioner.

We don't know what the response has been to units designed to meet this condition, but we do know that thousands of heat pumps and air conditioners are still being sold in the seacoast area that may last for years in other climates, but deteriorate rapidly under salt air and high humidity conditions.

One year later

The Pompano Beach installation described in May 1960 was re-checked in April 1961, and the following represent a few of the owner's comments:

"All of the old units have continued to go bad, particularly the fan motors, and we have also had three or four additional compressors go out during the last year. Another thing that is particularly bad on some of these units is the shell or sleeve which is used for installations through the wall. They rust so badly they are actually falling apart.

"We have recently purchased nine new units. All of those replaced were less than five years old. I believe it will be necessary to replace all of the remaining air conditioning units before the end of the fifth year following their original installation.

"We don't replace them as long as they are operative. We continue to replace the fan motors at a cost of about $50, which is quite expensive when you consider we do it every year.

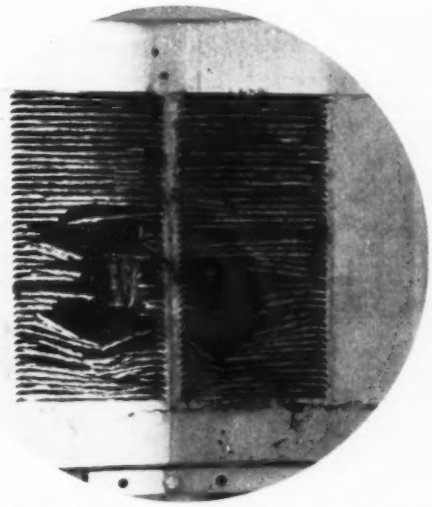
"There is a five-year guarantee on the compressor, and these have been replaced when they have gone bad, but of course we pay for the installation, which has been fairly reasonable — about $15-$18.

"The company has lived up to its guarantee. The drawback now is that the guarantees on all of the old units will expire within a few months. We will have to replace them anyway, because of the unsightly condition of the outside shells. The cost of a new shell is in the neighborhood of $60; that is just the outside metal casing or shell in which the heat pump is installed."

Long guarantee — short life

It will be noted that the units that have already been replaced preceded by about a year the expiration date of the compressor guarantee. According to the owner, all of the old units will be replaced within the next six months, all within five years since they were purchased.

Another point was made in connection with the replacement of fan motors. It is always necessary, it appears, to get the motor from some major city, as there is no warehouse in the immediate vicinity. "This is no good," says the owner, "when there is 100 percent occupancy and people are paying seashore rentals for a comfortable apartment."



This MPM photo shows the condition of one of the air conditioners referred to in this editorial. If any manufacturer feels he can identify this as a competitive unit, we suggest he refrain from comment until he investigates his own product in use under similiar circumstances.

Food for thought

We are hoping that this second report on an abbreviated case history, which undoubtedly could be repeated hundreds of times in the same area, might give appliance engineers (and management) interested in heat pumps and air conditioners some food for thought.

We repeat a few more points published a year ago:

"Why not give consideration to the use of materials with greater resistance to salt air corrosion — at least for the seacoast markets.

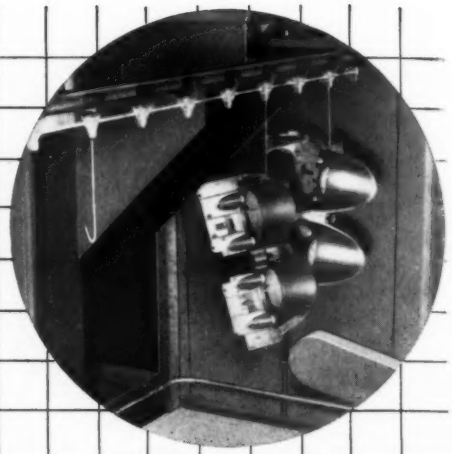
"Check on the possibility for simplified control systems *and* instructions that can be followed by any transient user." *(This has not been improved on the new units of a competitive make being currently installed.)*

"Question the advisability of selling reverse-cycle units that do not have provision for auxiliary heating units to take over when the weatherman turns on the 'cold' in sections where balmy weather is normally expected.

"The thousands of units in use in Florida can be the forerunners of many, many thousands more (with satisfied users), if manufacturing progress and service to the user can keep ahead of field requirements."

Dana Chase

EDITOR AND PUBLISHER



CAPITAL LOSS TURNED INTO PRODUCTION GAIN

from plant ruins to production records in sixty days

One of the toughest rebuilding problems confronting the Clements Mfg. Co. when their Deckerville, Mich., plant was completely demolished by fire, was speedy replacement of the finishing system needed for phosphate coating and painting of its diversified line of automotive diecast and sheetmetal parts.

The new system had to be versatile—had to handle many different sizes and shapes. It had to be inexpensive to operate fuel-wise and labor-wise. Above all, it had to be delivered and installed in a matter of a few days—it had to do a high quality job right from the start—and it had to take up little floor space.

Experienced MOCO design and process engineers rose to the challenge.

First, a 3 stage washing machine for phosphating and rinsing was designed and built at the MOCO plant, and shipped completely finished, except for piping hook-up, directly to the Clements Mfg. Co. plant.

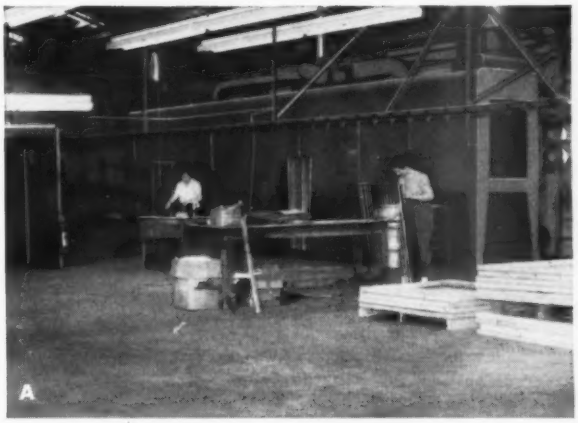
Next, MOCO engineers tackled the drying and paint baking problem. A combination Dry-off and Bake Oven was developed that could dry parts as they came from the washing machine on their way to the spray booths, and bake the painted parts as the conveyor returned them to the oven for a longer period before delivery to the conveyor unloading station.

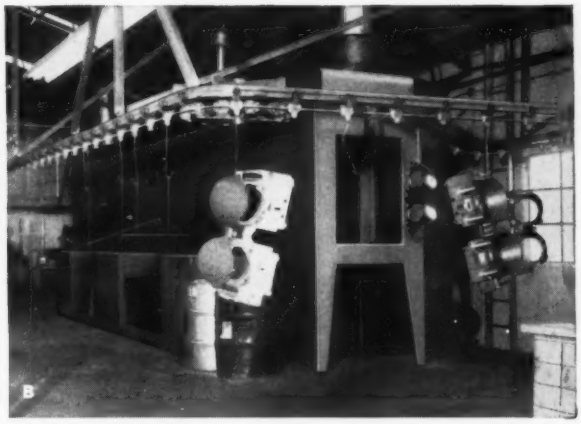
The Dry-off and Bake Oven was too large to ship already assembled, but MOCO's unitized design made assembly at the Clements Mfg. Co. plant a relatively simple matter.

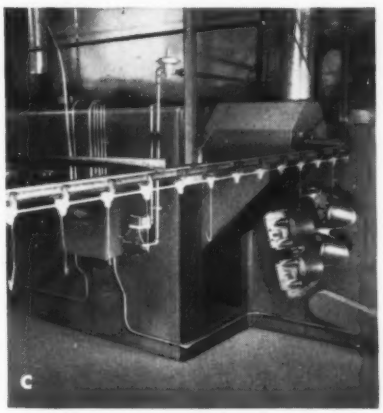
Within 60 days of the disaster, the Clements Manufacturing Company plant was back in full operation with production at a higher level than ever before, thanks to MOCO ingenuity, engineering skill and desire to serve its customers. MOCO problem-solvers will welcome the opportunity to serve you.

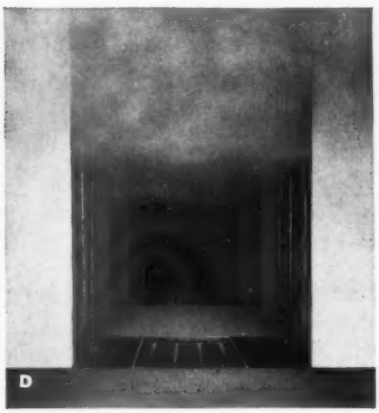
Write for the name of our representative nearest you.

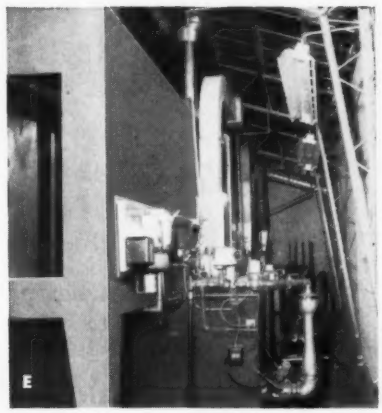
FREE—Send for your MOCO bulletin showing typical finishing system applications and specifications; no cost or obligation, of course.











A—Sixty days after the Clements Mfg. Co. plant was burned to the ground this finishing system was in operation in the rebuilt plant. In the right foreground workers are loading and unloading parts. Behind them is the MOCO Washing Machine. On the left, paint spray booths hide the MOCO combination dry-off and paint baking oven. B—Start of the completely conveyorized finishing cycle. From loading station at left parts enter MOCO 3 stage washing machine for washing, rinsing and phosphate coating. C—Finishing parts coming out of combination dry-off and bake oven on their way to unloading station. D—Entrance view of phosphating machine indicating risers, nozzles, street els, drain decks, access walkways, spray zone silhouettes shown immediately after pump stopped. E—3 stage MOCO washing machine showing tanks, fill and overflow pipes and valves, pumps, burners, controls and exhaust ducts.

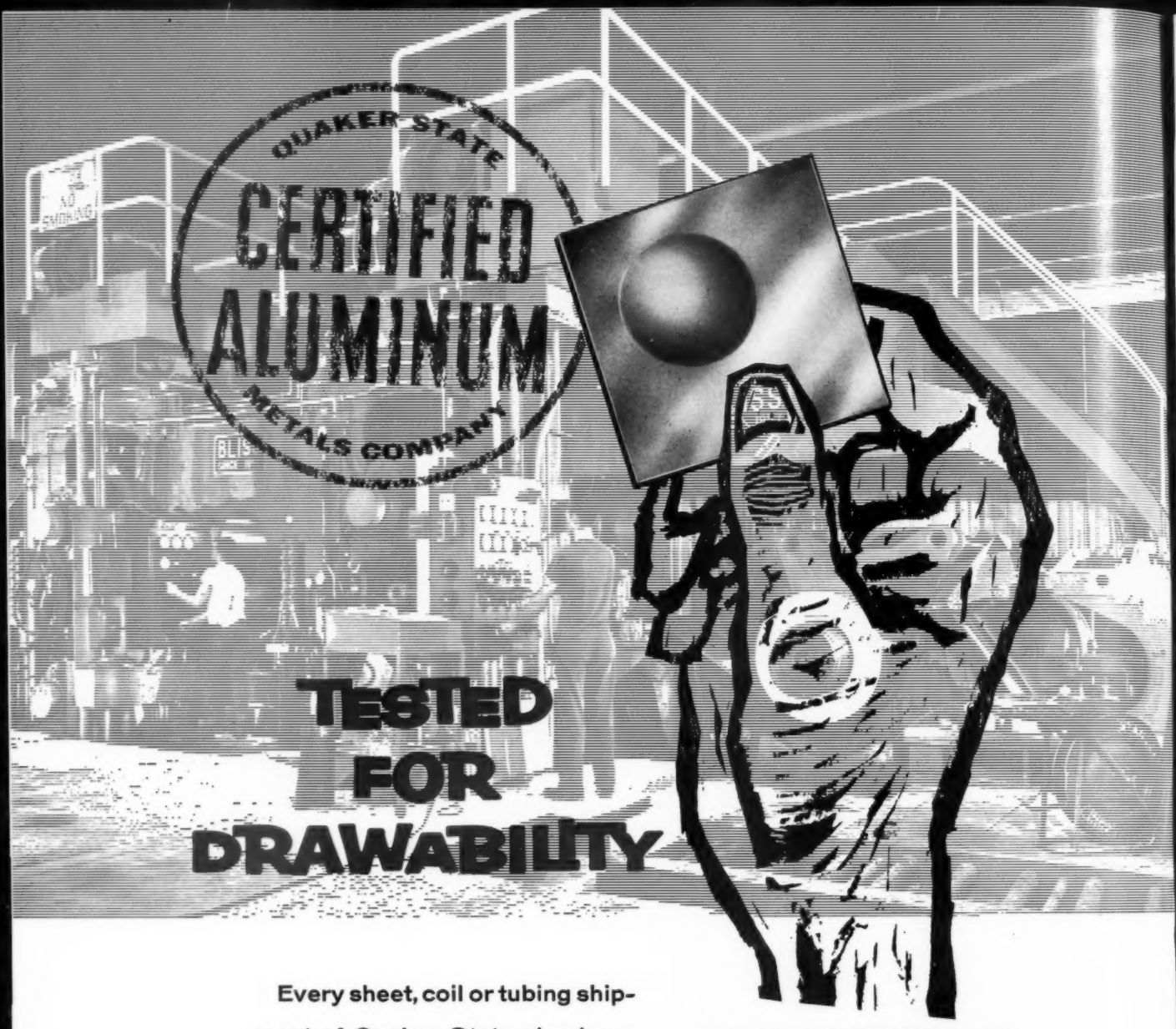
MICHIGAN OVEN COMPANY

MOCO

FINISHING EQUIPMENT DEPT. 423 BRAINARD DETROIT 1, MICHIGAN

WASHING MACHINES • BONDERIZING UNITS • DRY-OFF OVENS • DIP TANKS
SPRAY BOOTHS • FLO-COATERS • FINISHING OVENS • CONVEYORS

Circle No. 335 on Reader Service Card.



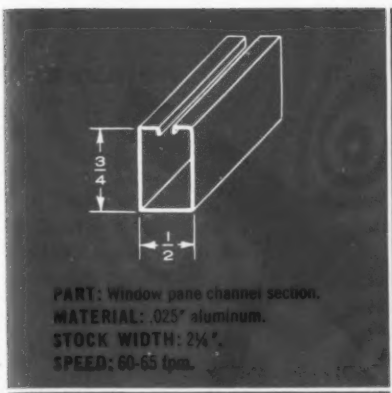
Every sheet, coil or tubing shipment of Quaker State aluminum is now certified in writing. It's your assurance that ***your*** order has passed our rigid standards of quality control to meet your exacting specifications.

TESTED FOR DRAWABILITY
Although not required by the Aluminum Association Standards, every order to be used in drawing applications undergoes this "cup" test to determine its drawing characteristics. Only after a metal has passed this extra QSM test does it receive the stamp of "Certified Aluminum."

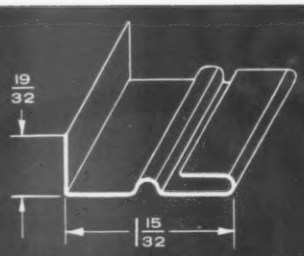
QSM
HOWE SOUND

QUAKER STATE METALS COMPANY
Lancaster, Pennsylvania
A DIVISION of HOWE SOUND COMPANY
Mill Producers of Aluminum Sheet, Coil, Tubing and Extrusions

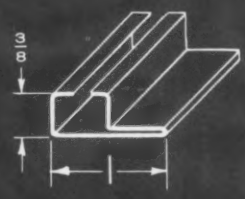
Circle No. 342 on Reader Service Card.



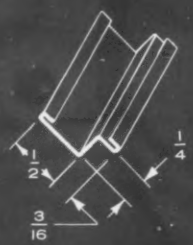
PART: Window pane channel section.
MATERIAL: .025" aluminum.
STOCK WIDTH: 2¼".
SPEED: 60-65 fpm.



PART: Fluorescent lighting fixture trim.
MATERIAL: 18 gauge CRS.
STOCK WIDTH: 2½"—run in pre-cut lengths.
SPEED: 40-45 fpm.

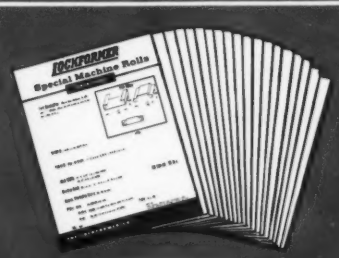


PART: Door or curtainwall track slide component.
MATERIAL: 22 gauge CRS.
STOCK WIDTH: Developed 2"¼".
SPEED: 45 fpm.



PART: Door or window weatherstrip.
MATERIAL: .020" aluminum.
STOCK WIDTH: 1⅛".
SPEED: 65 fpm.

PART: Toy and appliance handles.
MATERIAL: .025" CRS and pre-coated aluminum.
STOCK WIDTH: 1 1/16".
SPEED: 45-60 fpm.



FREE!

Complete set of current roll forming data sheets include all job details on a variety of parts. All are Lockformer jobs running now at big savings.

Speed is only <u>one reason</u> why it costs less to make these shapes on LOCKFORMER ROLL FORMING EQUIPMENT

1. COMPLEX CONTOURS IN ONE OPERATION.

2. PRODUCTION RATES NO OTHER FORMING METHOD COULD EQUAL (these parts being formed at speeds from 40 to 65 fpm).

3. ONLY ONE SEMI-SKILLED OPERATOR NEEDED.

4. UNIFORM SHAPES AND DIMENSIONS, FIRST PIECE TO LAST.

5. VERY SMALL INVESTMENT. (Machine and custom rolls to produce above parts range from only $1,710 to $1,990—*complete!* No high development costs—Lockformer special rolls are simply added to a standard mass-produced chassis.)

Manufactured by
THE LOCKFORMER COMPANY
Dept. MP 4615 West Roosevelt Road
Chicago 50, Illinois
In Canada: Brown Boggs Foundry & Machine Co., Ltd., Hamilton, Ont.

LOCKFORMER®
TIME SAVING, MONEY MAKING EQUIPMENT

Circle No. 329 on Reader Service Card.

For you who came in late

A short, short history of modern porcelain enameling

Look quickly with us from the porcelain enamels of the World War I period to the thin, tough, brilliantly beautiful coatings produced today. Then, porcelain enameling was more of an *art* than a science. Each "craftsman" zealously guarded his secret formulas, using whatever raw materials he could get, and constantly making "adjustments" to compensate for the variables that were ever present.

In 1920 the folks at Ferro set out to do something about this. First, a world-wide search was made for the finest raw materials. Then *checks* were developed to see that every shipment conformed to the "specs" in every way. Next, the material mixing and smelting operations were brought under scientific control, with frequent *checks* all through the process to assure complete uniformity in each frit produced for customers' use.

Thus was born the "Ferro Check" trademark. However, that's only the beginning of the story.

To help customers "fit" these better porcelain enamels to the wide variety of sheet-steels used in that day, Ferro developed an extensive "Customer Service" lab and field force. New mill additions were worked out. Better metal-pickling processes and firing methods were introduced. Then completely new furnaces were developed by Ferro, and the entire porcelain enameling process further refined for modern conveyorized, low-unit-cost production. By this time (1930) the Ferro Check, covering many products and services, had come to stand for *complete customer satisfaction* in any or all phases of porcelain enameling.

Today, thirty years later, you'll still find the Ferro Check trademark on Ferro's products and equipment. You'll find, too, that Ferro has maintained its position of leadership in serving the porcelain enameling industry—through product development, process refinements, new production techniques, all subjected to the usual "Ferro Checks" before they are brought to you . . . for your profit.

FERRO

FERRO CORPORATION

Cleveland 5 • Nashville 11 • Los Angeles 22

Circle No. 316 on Reader Service Card.

newsquotes

Last year three manufacturers of home refrigerators and home freezers offered consumers the choice of one or more models with automatic icemakers. This year nine manufacturers offer consumers the choice of one or more models with automatic icemakers. — *Duncan C. Menzies, Servel.*

Price alone does not lead to improved market penetration. Sales increases predicated on lower prices will have a short life. — *Robert E. Brooker, Whirlpool.*

The single market concept represents the greatest opportunity for U.S. manufacturers in Europe and England because it fully recognizes many significant transitions in tariff structure, economic growth and mutuality of interests among European countries. — *G. T. Etheridge, Kelvinator International.*

The first way to improve dealer relations is to shorten the distance between the manufacturer and the retailer and eliminate the roadblocks in between. — *Maurice M. Cohen, Lechmere Sales.*

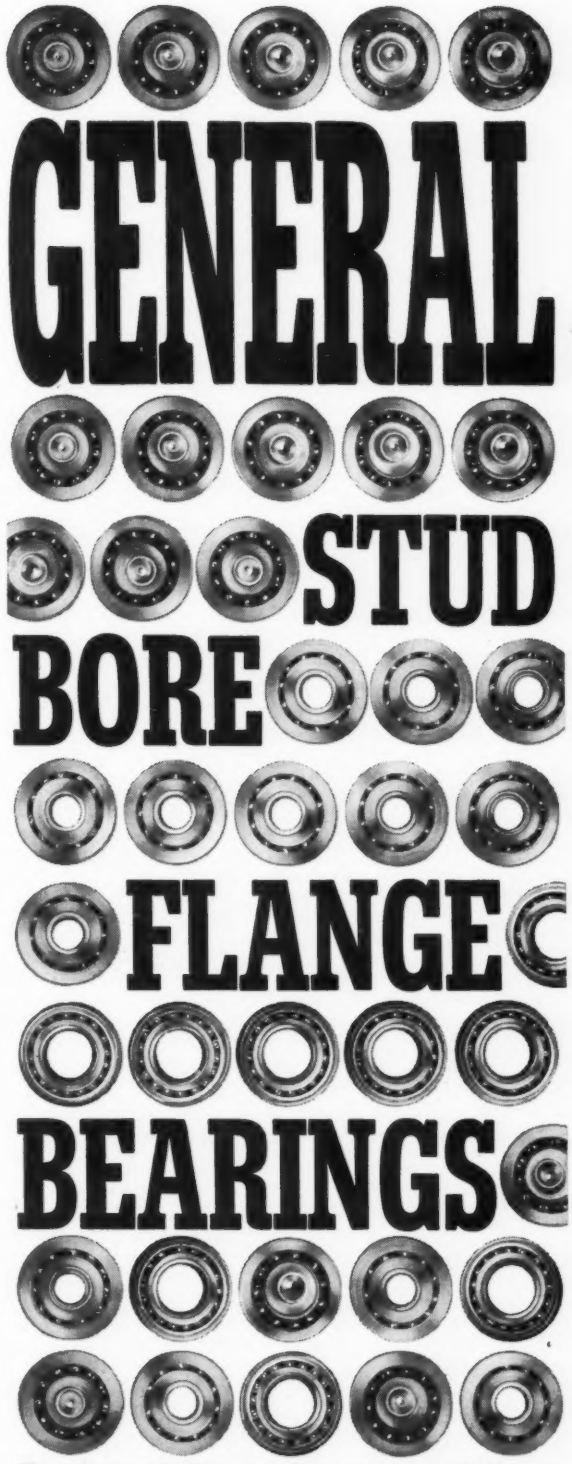
This trend [simplified distribution] means bigger self-service stores. It means fewer service people per sales dollar. It means greater use of computers. It means faster turnover of stock. It means that the seller must be more in step with the needs, wants and interests of the buyer. — *Stuart D. Watson, McCann-Marschalk.*

We must remember that while the consumer may be attracted by less expensive merchandise, he does not want "cheap" merchandise. — *Claire Ely, Maytag.*

The process of stifling incentives . . . is quite simply to tax-punish productive efficiency wherever it shows its head and everywhere to coddle the less efficient or the idle. If carried to the full this eliminates all of both types of incentives and converts everybody from the personal pursuit of productivity to the competitive practice of indolence. — *Robert C. Tyson, United States Steel.*

I see a newly realistic appliance industry. We've made just about all the mistakes we can afford to make in the area of profit management. — *Sol Goldin, Whirlpool.*

We believe that the 60's will bring about as great a change in America's living and working habits as did the 20's. And much of the change will not only be accompanied, but made possible, by the products of the air conditioning and refrigeration industry. — *R. K. Serfass, Westinghouse.*

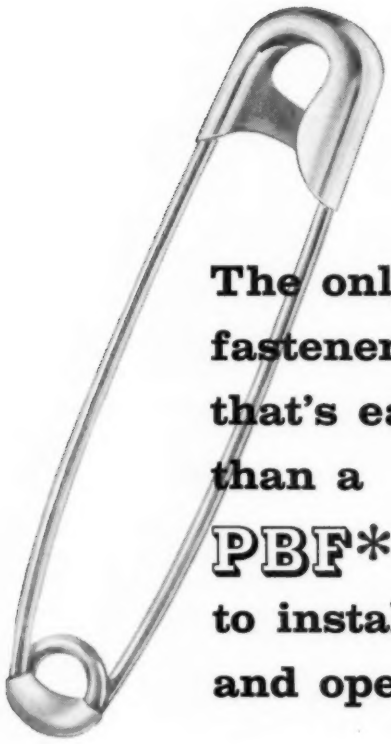


For dependable service and fast delivery, choose General low-cost, unground ball bearings and bearing assemblies.

GENERAL BEARING COMPANY

General Bearing Co., Inc./P.O. Box 455A, W. Nyack, N.Y

Circle No. 317 on Reader Service Card.



The only fastener that's easier than a PBF* to install and operate

- ▶ Single hole mounting
- ▶ No riveting
- ▶ No special tooling
- ▶ Low cost

*Camloc's New Quick-Mount Push-Button Fastener

Another example of Camloc's science of FASTEN/ATION... a totally new kind of push-button fastener that's as easy to install as it is to operate. Single hole mounting cuts installation costs. No rivet holes, no riveting, no expensive special tooling for rapid production line installation. Camloc has FASTEN/EERED new PBF fasteners with a unique, positive locking action for foolproof operation. One push releases. One push locks. Grip increments of .060 minimize tolerance build-up. If you have a special problem requiring quick-release fasteners, Camloc can provide FASTEN/ATING custom variations to meet your needs.

Specialists in Fasteners for Industry

CAMLOC

Camloc Fastener Corporation, 141 Spring Valley Rd., Paramus, N. J.
West Coast Office: 5455 Wilshire Blvd., Los Angeles, California
Southwest Office: 2509 W. Berry St., Fort Worth, Texas

Circle No. 308 on Reader Service Card.

MPM

editor's mail

Gas versus electricity

Gentlemen: My congratulations on your editorial in this month's MPM on the "Battle of the Fuels." I told Mort Farr that I was sure his talk before AHLMA would have some far-reaching effects, and I am delighted to find an editorial in this vein in a medium with as much influence as yours has on its industry readers.

Sol Goldin, Manager, Retail Marketing
Whirlpool Corp., Benton Harbor, Mich.

The problem of standardization

Gentlemen: Thank you for your letter of May 8, 1961. This letter included Part II of your article on "Standardization in Appliance Controls." It also contained two additional comments from the May issue.

I would appreciate twelve each of both Parts I and II and the two additional comments from the May issue so that I can pass them around among engineering executives working on the problem of standardization here at Philco.

Dan Jensen
Philco Corp.
Philadelphia, Pa.

Comment on acrylic finishes article

Gentlemen: Regarding your article, "A look at thermosetting acrylic finishes," in the May issue of MPM, I feel that the paragraph beginning with "What is a thermosetting acrylic finish?" needs some clarification. While it is possible to make thermosetting acrylic finishes with a thermosetting acrylic resin as the emulsion vehicle, this is the exception rather than the rule. Most thermosetting acrylic finishes used today contain organic solvents rather than water as the carrier of the resin.

Your definition of the word "thermosetting" is satisfactory, but it is also true that most conventional baking enamels also change chemically during the baking operation.

Perhaps the terms you want to use in this regard are "thermosetting vs. thermoplastic, wherein the thermoplastic baking enamels do not undergo chemical change in baking but are merely dried by evaporation of solvent."

There is some degree of misuse of terms in the present day promotion of

TO PAGE 51 →

PEMCO NEOWITE® 70

- high alkali & acid resistance
- excellent resistance to steam condensate
- low warp
- white or mill added colors
- excellent color stability
- low temperature (1400°) application
- competitively priced

PHOTOGRAM OF FLAKE FRIT

Universal? Almost, but not quite. But no one else can offer you all these outstanding qualities in one frit at any price. NEOWITE 70 is a truly premium frit, yet it comes to you at a basic, competitive price. Try NEOWITE 70 and see how many outstanding jobs this single, broad range frit can do in your operation. For more information and samples, write Pemco Corporation, Baltimore 24, Md.

RESEARCH AND A FLAME PEMCO® BALTIMORE 24, MARYLAND

HIGH QUALITY PORCELAIN ENAMEL FRITS AND OXIDES

Circle No. 339 on Reader Service Card.

Goldin re-elected IAM president

AN MPM STAFF REPORT

manufacturers delve into future for appliances at 29th annual IAM convention

THE INSTITUTE of Appliance Manufacturers held its 29th annual convention-exhibit at the Netherland Hilton Hotel in Cincinnati, Ohio, June 4, 5 and 6. Behind the podium during business sessions was a notable group of speakers from inside and outside the appliance industry. Well-known names from the appliance field included F. H. Guthrie, president, Newark Ohio Co., and former president of IAM; Sol Goldin, retail marketing manager of Whirlpool Corp., and IAM president; Pauline Dunckel, IAM executive secretary; Claire Ely, vice president of marketing, The Maytag Co.; and John Platts, vice president of refrigeration products for Whirlpool. Speaking for appliance dealers was Maurice M. Cohen, president, Lechmere Sales Co., Cambridge, Mass.; and representing the supplier group was Paul A. Lux, executive vice president, Lux Clock Mfg. Co., Waterbury, Conn.

Officers' slate re-elected

Sol Goldin was re-elected president, as were the three other IAM officers: executive vice president — A. B. Ritzenthaler, vice president of Tappan; secretary— E. Carl Sorby, vice president of Geo. D. Roper; and treasurer — S. B. Rymer, Jr., president of Magic Chef. Newly elected trustees are: Walter F. Rogers, president of Crown Stove Works; Reeves Brown, executive vice president of Hardwick Stove Co.; W. H. Martin, Jr., president of King Stove & Range; F. H. Guthrie, president of Newark Ohio Co.; and Walter G. Ullman, president of Siegler Heater Corp.

As an early order of business, the Institute board voted to invite the cooperation of other appliance industry trade associations in establishing an industry-wide "code of ethics" to cover all functions of appliance manufacturing and marketing.

Goldin on the "ethical recession"

"The appliance industry now is recovering from two recessions, an ethical as well as an economic dip," said Sol Goldin, as he opened the IAM convention.

He said most of the mistakes were of omission, rather than commission, in ignoring responsibilities for the revolution in distribution, in failure to establish standards for the trade-in practice and product service, and in inadequate follow-through on factory programs and policies. Other "misjudgments" mentioned included pirating of talent, hedges on warrantees, misuses of dealer trips and promotional allowances.

He then warned the industry against overcorrection by legislation, and predicted immediate ethical recovery. He suggested, however, that the ethical recovery would not be too fast or too smooth, and that it would take time, money and patience to keep such a reformation on schedule.

In referring to rock-bottom first-quarter earnings reports, Goldin said, "We now know that past practices have not made money, they have lost it, and that volume alone is no answer."

Fewer dealers needed

In the area of distribution, Goldin declared, "We have dropped from 90,000 dealers to just over 60,000 in the last 12 years. New methods of analysis show we could do the same business with about 13,500 dealers, properly equipped and organized. Now that we can pinpoint facts like this, we can institute the necessary corrections. And we're making tremendous progress."

Ely on the "industry image"

"You can't buy an image," asserted Maytag's Claire Ely as he told IAM members that building a favorable image, of an individual, corporation, or an entire industry, is a full-time job. It cannot be done, he said, simply by spending more money or talking about it. Rather, it takes deeds and action.

With business failures among retail appliance stores running nearly two and a half times the rate for total retail business, Ely asked whether "our industry encourages poor business practices by dealers" through inadequate or misleading programs — causing dealers to overextend their credit.

He emphasized that a healthy appliance industry is dependent upon a sound dealer structure. Other important points, he said, include building quality products, developing features with strong customer appeal, making dependable products requiring a minimum of maintenance, employing an honest advertising program based on merits rather than price, and in using an efficient and effective means of solving service problems.

The Maytag executive cited advertising practices which emphasized price alone, which are misleading and make false claims, or which "testify to the dealer's bad judgment or poor management by screaming, 'I'm overloaded with merchandise, I need space — giant clearance sale.'" Ely commended the efforts of AHLMA for establishing a code of advertising practices.

A picture of the European Common Market

Dr. William Van Goethem, Usines et Fonderies — Arthur Martin, Paris, France, and a delegate of the Appliances Manufacturers Union of France, made these comments at the IAM conference: "The European manufacturers are more and more conscious of the Common Market which is now in a most active phase. This is now an irrevocable movement. Although originally an American effort, it now has entered the European mind.

"No American manufacturer can afford to remain out of this increasing market of 165 million customers, whose buying capacity is growing at least five percent a year.

"But," advised Van Goethem, "you should not believe that this market can absorb a large quantity of American products if they are not adapted to the European's needs.

"The U.S.A. is a country of wide areas, of wide-spread bungalows, of big cars, of big appliances, of high salaries. Europe is a country of narrow grounds, small apartments, small cars, small appliances . . . and of salaries just one-half or one-third as large as in the U.S.

"I believe," continued Van Goethem, "that the efficiency of sales into Europe will depend on technical, commercial or financial agreements between American firms and firms of our countries. The American firms will bring their science of engineering, productivity and marketing . . . and the European firms will add their knowledge of the local market (habits, customs and incomes) and of the items and prices that fit best. But you and I both know by experience that there cannot exist a sane international economy if the exchanges are not balanced."

Fifteen million "small-majors"

Van Goethem warned that the American market for smaller size appliances (refrigerators of small capacity, washing machines only 16 inches broad, and three-burner ranges) is not big enough to justify the setting up of production lines here . . . while it does justify the effort in Europe where such items are already in mass production.

Last year, the speaker concluded, the six countries of the Common Market produced four million refrigerators, three million washing machines, five million ranges, and three million space heaters, but these products were just half as big, half as luxurious, and half as expensive as their U.S.A. counterparts.

Dealers and suppliers speak

"Manufacturers and distributors are not keeping up with the revolution in appliance distribution," Maurice M. Cohen charged before the appliance manufacturers.

Cohen claimed that gas appliance makers have failed to meet *standardization* obligations; that manufacturers and retailers are drifting too far apart; that distribution methods are outmoded; and that private label merchandise is getting the break in retailing efficiency.

"If the manufacturers will face these problems squarely, devote some of their vast research and development efforts to marketing, and take the retailer into partnership," Cohen promised, "then the retailer can help eliminate expensive mistakes and cut distribution waste."

Cohen voiced the fear that "the gap is widening" as far as manufacturer-dealer relationships are concerned.

Paul A. Lux, speaking for suppliers, touched on the subject of lead time, annual model changes, the price squeeze, and similar points of mutual interest to supplier-customer working relations.

In referring to double inspection as a part of production cost, Lux said, "I firmly feel that the appliance manufacturers could survey their suppliers and determine if they have adequate inspection and acceptable quality levels. If this is determined, then certainly there is no need for double inspection."

The IAM program listed 67 exhibitors of components and materials used in the appliance industry. From a survey of two floors of exhibitors, the general attitude of suppliers may be said to be conservatively optimistic for the coming months. —MPM

16 COMPANIES SEE AN UPTURN IN APPLIANCES

quotations from a canvass of appliance industry top executives at the opening of the IAM convention

Eighteen companies answered the question, "What are your company's sales expectations for the second half of 1961?" Sixteen of the 18 companies reporting saw an improvement in business over the same period for 1960. Only two forecast lower sales.

The following represent brief quotations from the 16 executives who see an upturn:

A. O. SMITH—"Our sales now are up eight percent over a similar 1960 period, with 30 percent of the increase from top-of-the-line, deluxe water heaters . . ." *M. E. Morgan, vice president.*

WESTINGHOUSE—"We continue to predict a slight improvement for the last six months of the year." *J. W. Craig, vice president and general manager.*

NORGE—"The appliance industry definitely will make a strong upsurge and finish ahead of last year." *Judson Sayre, chairman.*

KELVINATOR—"We believe that the upturn on major appliances should be in the area of ten percent and that total sales for the calendar year could equal 1960."—*H. L. Travis, sales vice president.*

CHAMBERS—"Chambers' first-half sales are considerably up over 1960 . . . Increases in the second half should result in a rise to 20 percent over 1960 sales." *Fred Flato, president.*

PHILCO—"A gradual improvement in the appliance business will be felt at all trade levels during the last half of 1961." *Henry E. Bowes, vice president and general manager.*

DEARBORN STOVE—"We are due for a definite upturn in the general economy and the appliance business is going to turn up equally." *Robert H. Norris, president.*

AMANA—"We expect business to continue at least as good as it has been for the first part of the year . . ." *George C. Foerstner, executive vice president.*

REPUBLIC - TRANSCON—"We believe that dryer sales will pass washer sales within a three-year period." *Milton J. Stevens, chairman.*

O'KEEFE & MERRITT—"We anticipate the present trend (a slow upturn) will continue and that the last half of the year will be substantially improved." *Frank Breckenridge, vice president and general manager.*

HUPP CORP.—"We expect the second half of this year to be better than the second half of 1960 . . . a mild increase, nothing spectacular." *A. J. DeFino, group vice president.*

TAPPAN—"We believe our last six months will materially exceed the first half volume as well as last half of 1960." *W. R. Tappan, president.*

EUREKA WILLIAMS—"The sales picture will strengthen during the remainder of 1961 and Eureka Williams may reach a new high in annual volume." *R. C. Connell, vice president.*

TEMCO—"Our field checks indicate the beginning of an upturn in heater buying that should generate into considerable demand for the second half." *F. Donald Hart, president.*

WHIRLPOOL—"Whirlpool expects a second half upturn in industry sales of major home appliances . . ." *Sol Goldin, retail marketing manager.*

MAYTAG—"The second half of 1961 should be improved saleswise from the first half and also from the last half of 1960." *Claire G. Ely, marketing vice president.*

Aluminum Island.

Is this tomorrow's marina? The boat company that commissioned this Olin design thinks it's very likely. After all, new design and engineering concepts and new fabricating techniques make aluminum near limitless in application. Aluminum's inherent qualities, resistance to corrosion, lightness, natural attractiveness and strength make it a "dream medium" for designers; this marina is an excellent example. It's an on-the-spot depot for fuel, food, marine supplies – and travels from place to place under its own power. And designers who work in new concepts of aluminum have the resources of Olin Aluminum at their disposal. Our technical research and product development staff live in the world of new alloys, intricate design, fabrication, and cost and production statistics. They "think aluminum." All you have to do is think "Olin."®

Olin
ALUMINUM
400 PARK AVE., NEW YORK 22, NEW YORK

USE READER SERVICE CARD.

FOR MORE INFORMATION ON ADVERTISING, NEW LITERATURE, OR NEW PRODUCTS, USE READER SERVICE CARD.

FOR MORE INFORMATION ON ADVERTISING, NEW LITERATURE, OR NEW PRODUCTS, USE READER SERVICE CARD.

FOR MORE INFORMATION ON ADVERTISING, NEW LITERATURE, OR NEW PRODUCTS, USE READER SERVICE CARD.

Looking For Savings? Then Read . . .

Lockheed F-104A Starfighter with aluminum surfaces protected by Iridite 14-2.

How IRIDITE® Helps Lockheed Cut Aluminum Finishing Costs

Nine years ago, Lockheed switched from anodizing to Iridite chromate conversion coatings. That year, they saved over $40,000 in materials and manpower.

Today, Lockheed is still saving money with Iridite 14–2. Here's how:

Process time is reduced from 45 minutes to a maximum of only 5 minutes. Three times as much work is processed in a single run. Easy-to-load baskets, replacing costly anodizing racks, save $15,000 per year. Expensive electrical equipment is eliminated because Iridite is a simple chemical dip.

Moreover, Iridite 14–2 gives improved corrosion resistance, easily meeting MIL–C–5541, and provides excellent paint adhesion.

More than likely, Iridite can save you money and give you better finishing results than your present method. Discuss it with your Allied Field Representative. Or, write for literature.

Allied Research Products, Inc. 4004-06 EAST MONUMENT STREET • BALTIMORE 5, MARYLAND
BRANCH PLANT: 400 MIDLAND AVENUE • DETROIT 3, MICHIGAN

West Coast Licensee for Process Chemicals: L. H. Butcher Co. • European Agent: Sture Granberger, Storgatan 10, Stockholm, Sweden

Chemical and Electro chemical Processes, Anodes, Rectifiers, Equipment and Supplies for Metal Finishing

IRIDITE® Chromates | IRILAC® Coatings | ISOBRITE® Brighteners | ARP® Supplies | WAGNER Equipment

Circle No. 302 on Reader Service Card.

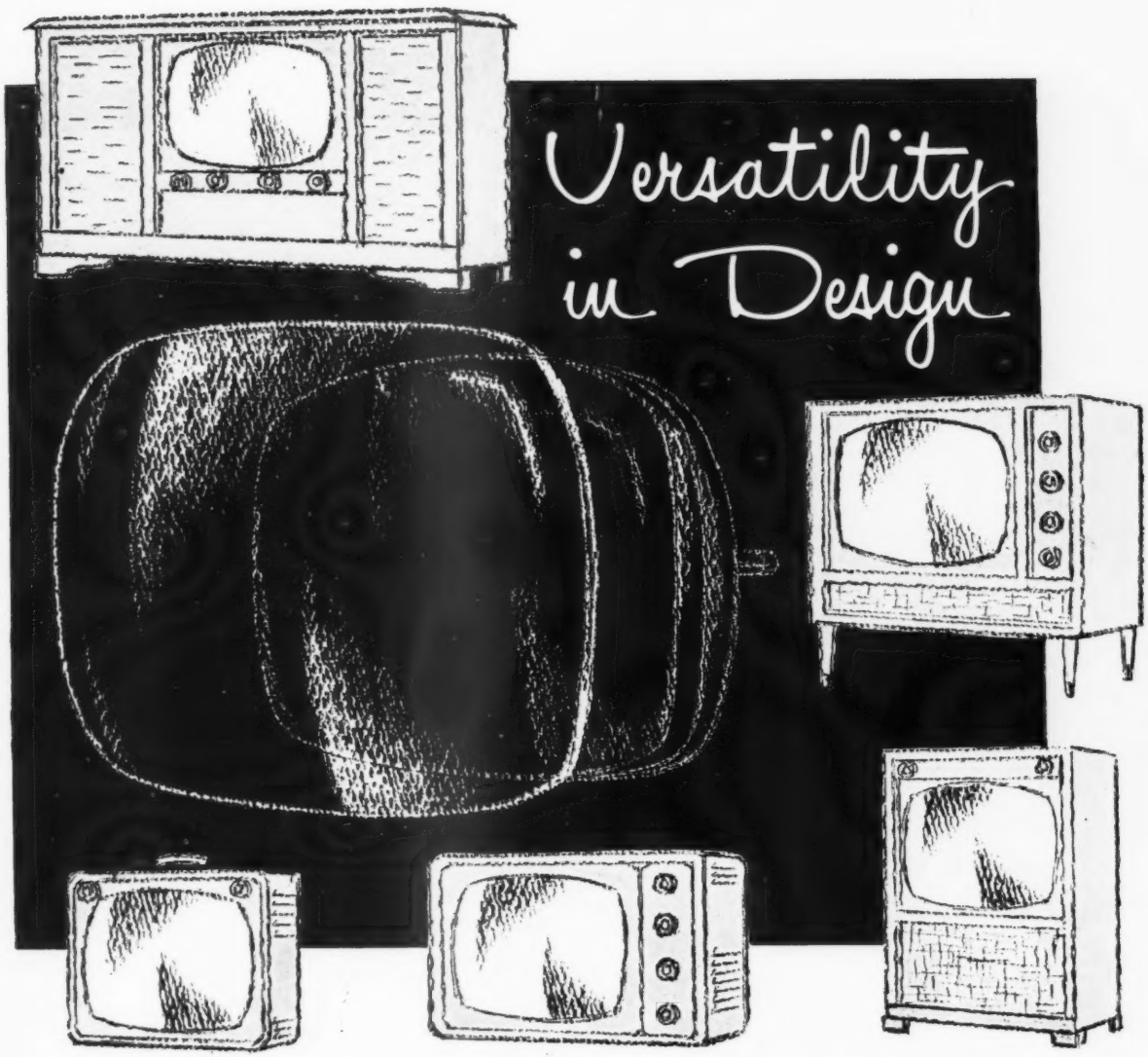
H•K

THE HARRINGTON & KING PERFORATING CO., INC.

5640 FILLMORE ST.
CHICAGO 44
ILLINOIS

116 LIBERTY ST.
NEW YORK 6
NEW YORK

FINE ARTICULATION OF SHAPE.
AN HONEST EXPRESSION OF
MATERIAL CONFIGURATION.
GREAT FUNCTIONAL FLEXIBILITY
AND DIVERSITY OF APPEARANCE
THROUGH A WIDE SELECTION
OF PATTERNS.
THESE ARE THE QUALITIES OF
H & K PERFORATED MATERIALS.
LITERATURE, DESIGN
AND TECHNICAL ASSISTANCE
IS AVAILABLE.
INQUIRIES ARE INVITED.



GLASS — one of the most versatile of materials. In the hands of a designer — unlimited potentiality of product design — if complete freedom of both material and designer is blended. — Why limit TV design?

Use glass designed to and for the complete TV cabinet — not just the tube. **MARSCO** can supply curved TV glass engineered to your specifications.

Design into your product—glass by **MARSCO**—Complete flexibility of design.

Applications for Marsco heat-treated, tempered and hardened glass parts:

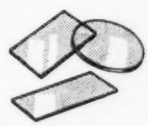
• CLOCK & TIMER CRYSTALS • OVEN DOORS • DIALS & NAME PLATES • TELEVISION EQUIPMENT
• PHOTOGRAPHIC EQUIPMENT • LIGHT LENSES • BACKGUARD GLASS FOR RANGES • SHELVING

Special Shapes for: Instruments, Gauges, Household and Industrial Appliances.

Marsco

Bent Glass

Convex Glass


Heat-treated Glass

MARSCO MFG. CO., 2901 S. HALSTED ST., CHICAGO 8, ILL.

Circle No. 333 on Reader Service Card.

← Circle No. 322 on Reader Service Card.

Polymerin®

HELPS SELL GLOBE-WERNICKE OFFICE EQUIPMENT

For more than three-quarters of a century, The Globe-Wernicke Co., Cincinnati, Ohio, has been manufacturing office furniture and equipment to the most rigid standards of quality, and one of its most important concerns is with the finish.

For Globe-Wernicke knows that in today's world of color, the attractiveness of the finish helps importantly to clinch that first sale. It also knows that rugged durability and resistance to impact, abrasion, perspiration, alkalies, and detergents keep the equipment looking new and bring the satisfied customer back for more.

That's why Interchemical's POLYMERIN has been a Globe-Wernicke standard for many, many years.

Are YOU looking for a finish that will stand the test of time? Try POLYMERIN! You'll like its trouble-free performance!

Interchemical
CORPORATION
Finishes Division

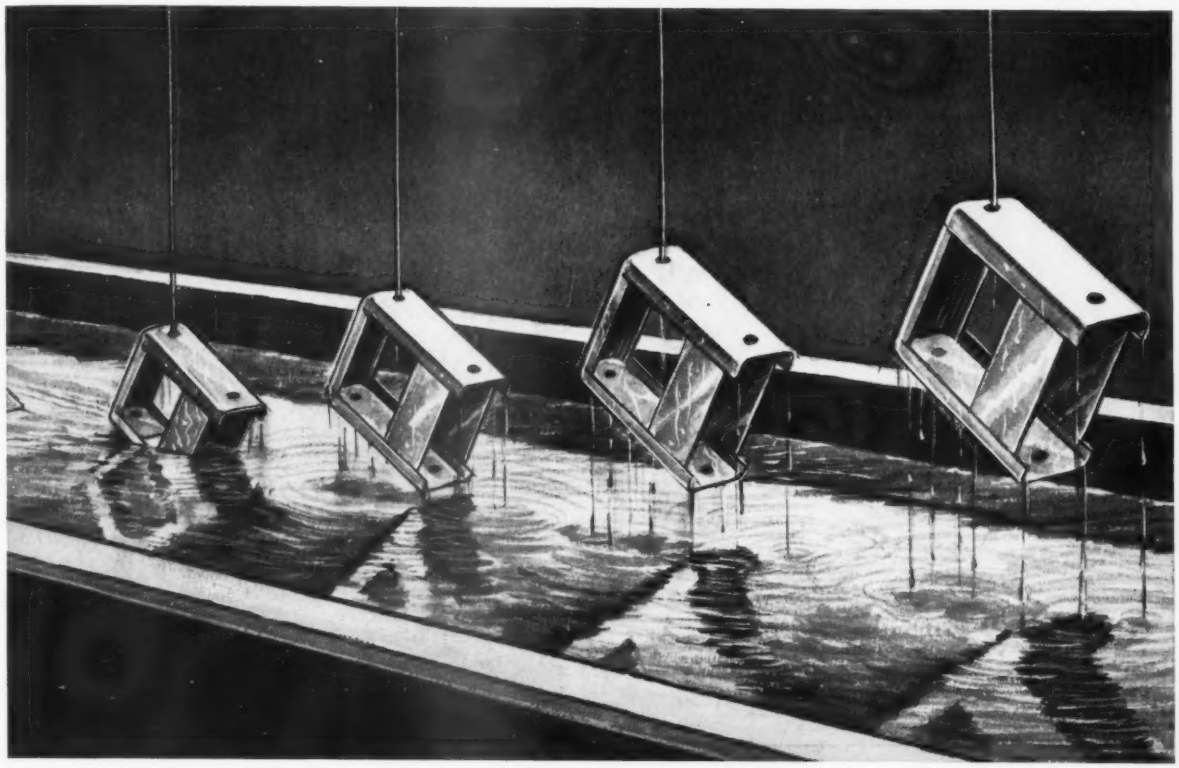
Headquarters Office: 224 McWhorter Street, Newark 5, N. J. Factories: Chicago, Ill. • Cincinnati, Ohio • Elizabeth, N.J. • Los Angeles, Cal. • Newark, N.J. • Mexico City, Mex. In Canada this product is made by Aulcraft Paints Limited, Toronto, Ontario, and sold under its trademark. **POLYMERIN is a trademark of Interchemical Corporation.*

Circle No. 326 on Reader Service Card.

For what's new in cleaning/phosphating

ask Oakite

OVER 50 YEARS CLEANING EXPERIENCE • OVER 250 FIELD SERVICE MEN • OVER 160 MATERIALS



OAKITE CrysCoat® 187

NEW—cleaning/phosphating process—FOR TANKS!

Now, by the tank-immersion method, you can get cleaning/phosphating efficiency comparable to pressure spray washing—with new CrysCoat 187.

This remarkable Oakite CrysCoat formula does two jobs in one. Its special detergent and solvent action removes a variety of smuts and shop soils . . . then CrysCoat 187 converts steel surfaces to a dense phosphate layer that walls out rust . . . bonds paint tightly.

CRYSCOAT 187 SAVES YOU TIME. It cleans and phosphates soiled parts in three to ten minutes. No time lost in mixing powder, either, because CrysCoat 187 comes in liquid form. Too, pH control is maintained quickly, easily.

CRYSCOAT 187 SAVES YOU MONEY. Gives you smoother iron phosphate coatings, calculated to soak up less paint than coarser phosphate layers. Solution life is longer, too.

CrysCoat 187 is the latest member of an entire family of Oakite CrysCoat processes. Each is designed to fill your special requirements. Ask your local Oakite man to "job-match" a CrysCoat material to your needs. Or send for FREE bulletin. Write Oakite Products, Inc., 26 Rector Street, New York 6, N. Y.

it PAYS to ask Oakite

OAKITE

SCIENCE

over 50 *Est. 1909*

years' leadership in industrial cleaning

Circle No. 337 on Reader Service Card.

How Hotpoint designed for standardization AND flexibility

STANDARDIZATION SERIES

IN THE OCTOBER 1949 issue of this publication, a complete 60-page section was devoted to "The World's Largest Electric Range Plant," which was then in operation at Hotpoint Co. Twenty-seven pages of editorial description and photography were used to carry the engineering story and a description of plant production from fabrication through handling and shipment.

Many basic changes have taken place in the market place, in engineering, and in plant production techniques in the intervening 12 years, and this current report will bring MPM readers up-to-date on the current picture in the Hotpoint Range Div. with respect to design engineering.

In the 1949 report under a heading, "Standardization for mass production," Hotpoint's vice president of engineering had this to say: "Standardization — whether related to the manufacture of electric ranges, automobiles, or prefabricated houses — is an essential ingredient in any successful mass production operation. The world's largest range plant achieves a degree of standardization never before approached in the appliance industry."

Prior to the building of the then new one million-sq.-ft. range plant, the Hotpoint electric range line included 13 different range bodies in three different finishes. There were 10 types of cooking tops, 8 oven linings, 11 range doors and 40 front panels. While the individual models had an overall resemblance, few parts were interchangeable. In production, synchronizing the flow of this wide variety of component parts was in itself a real problem.

The standardization referred to by the vice president was based on an executive agreement that, with the exception of a small apartment house model, all models would be essentially the same range from the floor to the work surface, with only one basic range required. This standardization included range drawers, oven liners and other component parts throughout the entire line.

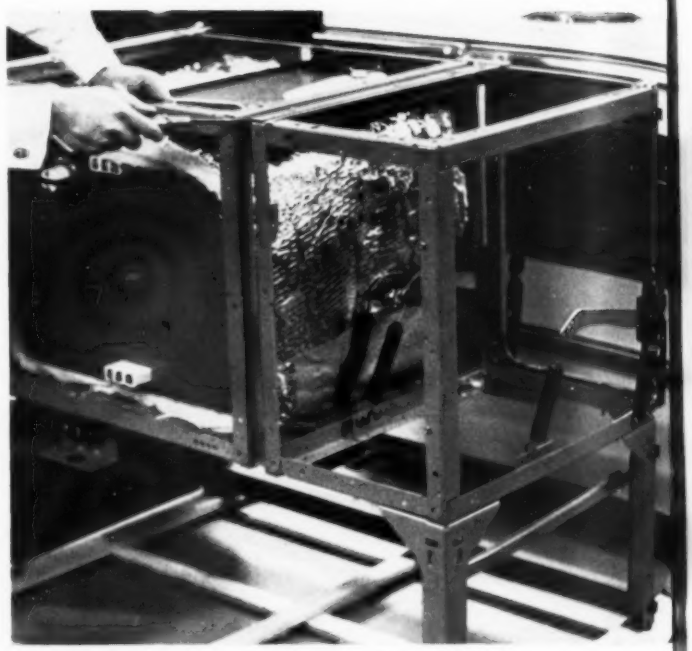
As our readers may remember, the range plant had an annual production capacity of 600,000 ranges per year, and at one time a rate of 12,000 ranges per week was actually exceeded.

The complete range body fabrication line, from the slitting of the steel to size, through stamping, forming, and welding, was all synchronized for straight line operation, with each operation as completely automatic as practicable.

Changing times require greater flexibility

About three or four years ago, the Hotpoint Range Div. began to face up to the problem that there was no longer a possibility of producing to a maximum of 10,000 ranges a week with a very limited number of models based on a single, basic, wrap-around body, which limited itself to very few modifications at any reasonable expense.

The design and advanced development sections were given the job of developing a modular type of construction which would combine as much "standardization" as possible, while at the same time giving flexibility for a variety of models through variation in basic components.



This view shows channel which joins two C-frames on 40-in. range body. Four C-frames are used on the 40-in. model — two form the side members for the standard oven and two others (right) form frame for a storage compartment on the low-end models or for an 11-in. oven on the top end of the line.

MPM PHOTOS

The demand for a variation in models was on the increase. Hotpoint went from a selection of about a dozen models for a single year up to a current requirement for from 75 to 100 models.

The earlier high production range had been confined to a 39-in. body. This continued up until about 1952, when the 30-in. body was introduced, calling for approximately twice the number of individual models. Then, about 1954, came the built-in oven lines where an entirely different approach to range oven construction was required.

The current type of oven and body construction was first put into actual production on the built-in oven line or the "custom line" for 1960, and was introduced for the first time on the cabinet range line beginning with the 1961 product. The year's experience on the built-in oven line was invaluable to engineering and production in their work on the cabinet range.

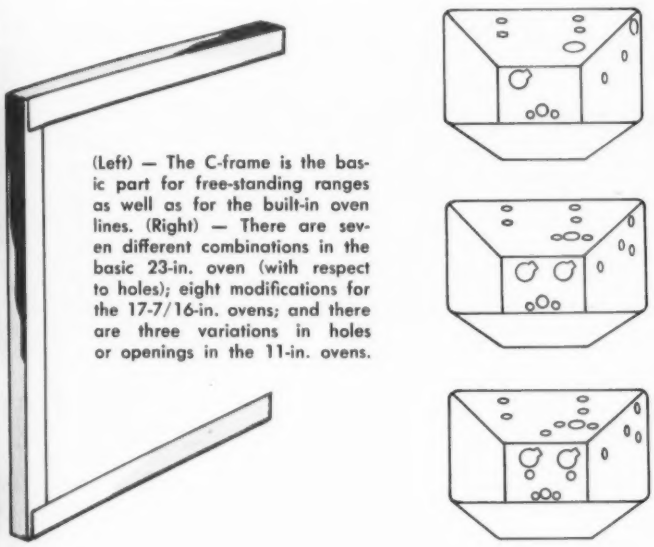
A casual comparison between the all-welded, wrap-around

type of construction as described in 1949 and the return to a rigid frame and leg construction with "curtainwall" panels might at first appear to be a 12-year step backward.

Closer study, however, shows that the engineering concept of the 1960-1961 rigid frame, rigid leg and hang-on panel construction is a far cry from the earlier designs which preceded the "standardized" unit body.

C-frame construction simplifies model changes

The basic C-frame of the new model can be used as a common part for the free-standing ranges as well as for the built-in oven lines. Hotpoint engineers have come up with some real innovations in welding and material processing to produce a basic frame at a cost that makes the whole program practical. The removal of the side panel disclosed a number of holes punched in the C-frame. Many of the holes



(Left) — The C-frame is the basic part for free-standing ranges as well as for the built-in oven lines. (Right) — There are seven different combinations in the basic 23-in. oven (with respect to holes); eight modifications for the 17-7/16-in. ovens; and there are three variations in holes or openings in the 11-in. ovens.

are not used for any one single model. but in combination they give the flexibility to the frame which permits using it in a broad range of models.

Not only does the advance engineering provide for many model changes in a current year's line, but it is anticipated that the C-frame approach will enable the manufacturer to go from model to model and make modifications in size, too, if necessary, with minimum capital and tooling expense.

Significant in this connection is the elmination of the need for many of the large single-purpose machines required for the "automated" approach. This, according to Hotpoint engineers, has generated interest in new machines, new tools, new welding equipment, and new materials handling methods.

It will be obvious that this new assembly technique requires the use of more single pieces to be fastened together than in the previous wrap-around body. This assembly is accomplished primarily with air-driven wrenches using self-tapping or self-threading attachments.

The standard parts principle proves practical

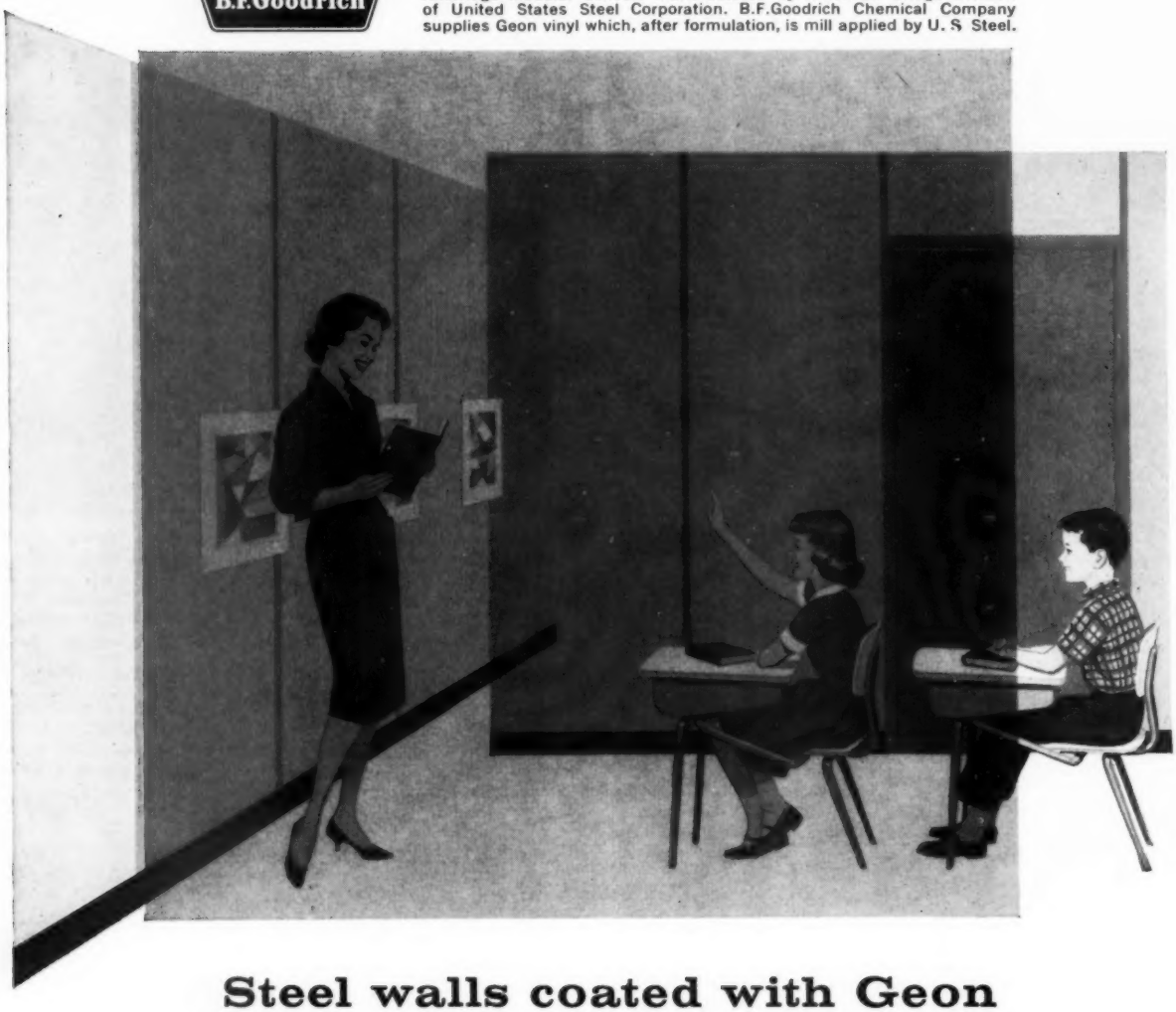
During the engineering stage of the C-frame and leg construction, slow-motion movies were used to check the cabinet development. These were taken during the application of vibration and incline impact tests to show the actual results on the frame construction as these tests were conducted. This method was used to determine the feasibility of going back to the bolted frame type of construction. TO PAGE 27 →

Side panel has been removed from 30-in. range (panel standing behind range) to expose C-frame construction and oven insulation. Identical C-frames are used in construction of different range and built-in oven models by varying the length of cross members. Glass fiber insulation has an aluminum backing which allows a reduction in thickness of the insulation from 3 in. to 1 in.

R. E. Furhman, supervisor of range design engineering, points out a design feature of new range line which allows three-high stacking in freight cars (two high was the previous maximum), and also permits higher stacking in warehouse. By removing two screws, Furhman demonstrates how the complete back splasher swings down on hinges, substantially reducing overall height of the unit.

B.F.Goodrich

These steel wall panels coated with Geon are one of the components in the Ambridge Modular Schools manufactured by American Bridge Division of United States Steel Corporation. B.F.Goodrich Chemical Company supplies Geon vinyl which, after formulation, is mill applied by U. S Steel.



Steel walls coated with Geon teach schools a lesson in cost

It's a lesson that may save you money, too! Schools built with these wall panels need less costly foundations because of the lighter-weight walls. Teachers get more classroom space because panels are so slim. And maintenance is easier because they are coated with Geon vinyl.

The Geon coating is really rugged. It withstands toughest treatment, doesn't show the marring and scuffing of other materials. It's washable and comes in a variety of permanent, pleasing patterns and colors—not affected by sunlight or corrosive atmospheres.

This coating is tough—it is applied to steel *before* fabrication. Geon-coated steel can be sheared, slit, punched, lock seamed, stamped, drawn and otherwise fabricated by conventional means without damage to the surface. This Geon coating is ideal for any product made of sheet steel that can benefit from enhanced appeal and durability.

Here's another way that Geon improves products, opens new markets. For information, write Department NB-5, B.F.Goodrich Chemical Company, 3135 Euclid Avenue, Cleveland 15, Ohio. In Canada: Kitchener, Ontario.

B.F.Goodrich Chemical

a division of The B.F.Goodrich Company

Geon VINYLS

Circle No. 319 on Reader Service Card.

"FROM OUR ANALYSIS OF THE MARKET OF THE IMMEDIATE AND LONGRANGE FUTURE, THE REQUIREMENTS OF THE ULTIMATE CUSTOMER ARE SUCH THAT WE NEED MAXIMUM FLEXIBILITY TO MEET THE FIELD DEMANDS. WE FEEL THAT THIS APPROACH TO MANUFACTURE AFFORDS THIS."

W. C. Smitley, Manager
Range Engineering

Hotpoint standardization

→ FROM PAGE 25

The flexibility obtained through the use of varied lengths of tie-in members between the C-frames is applicable not only for individual 30-in. units, but for combination oven 40-in. units as well.

This same modular principle or "standard parts" principle is used in the oven. Here a single wrap-around or "center wrap" includes bottom, back and top. This center wrap in varied widths is used in connection with standard right and left drawn stampings (including shelf lugs) which are welded to form the different sized ovens required. This means, of course, that oven height and depth are constant throughout the complete line, and that the center wrap is the only part that need be varied.

There are seven different combinations in the basic 23-in. oven; there are eight modifications (with respect to holes) for the 17-7/16-in. ovens; and there are three variations or modifications in holes or openings in the 11-in. ovens (the 11-in. is the second or smaller oven in a double oven, 40-in. range). This means that for the standard larger ovens there are a total of 15 models or modifications from only two wrap-around widths, providing for everything from a "strip down" oven model to a de luxe, top-of-the-line unit with two roto grilles, two oven lights, and a meat jack for "roast right" thermometer.

In production, all of these necessary openings are provided for with a combination of "knock-outs" in the unit and a few provisions for die punch removal during stamping. It is indicated that these holes are provided for in the die sets and that it is very simple to remove the punches not required for the particular model.

With almost 50 percent of electric range production going to built-in at the Hotpoint plant, it is particularly interesting to notice the standardization between the Custom-Crest built-in oven, RL75-B, and the Hotpoint Drop-In RF35-B. The basic assembly is the same; the control panel has been removed from the built-in and replaced with two separate control units, and the cooking top has been added for the surface unit as against the built-in oven. Aside from this and a trim around the front for the Drop-In range, the parts are identical.

Packaging simplified and costs reduced

Along with the C-frame approach for 1961 on the cabinet range line, an additional feature was introduced which lowered packaging costs considerably. The new cabinet range is designed so the removal of two screws allows the complete back splasher to be dropped on hinges to a position back of the range body, thus reducing the overall height by 13 in. This reduction makes it possible to ship ranges three-high in freight cars, as opposed to two-high stacking used previously and, in addition, permits higher stacking in warehouses.

Here's how
Tecumseh UTILIZES
Fin-Spin® CONDENSERS

Tecumseh is another major manufacturer of refrigeration equipment who specifies WALL TUBE Fin-Spin® condensers on its ¼ and ⅓ hp baseless highsides models. The increased efficiency of this finned tubing permits an economy of installation which pays off for Tecumseh's customers in more compact, more attractive refrigeration units. WALL TUBE representatives work closely with Tecumseh design engineers to keep constantly abreast of their requirements and to insure service and delivery are to Tecumseh's advantage. WALL TUBE has specialized in maintaining the high standards of the refrigeration industry for more than 20 years. We'd be pleased to have an inquiry regarding your requirements!

WALL TUBE AND METAL PRODUCTS CO.
NEWPORT, TENNESSEE

Circle No. 354 on Reader Service Card.

Both bright and brushed Nickel-Chrome Plating are combined for lasting beauty and serviceability in this attractive oven and range.

For two-tone beauty at a practical cost... bright and brushed Nickel-Chrome Plating!

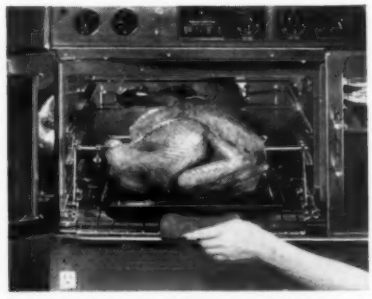
Notice how the contrasting beauty of bright and brushed Nickel-Chrome Plating enhances the charm of this handsome built-in oven and range.

But this two-tone beauty is only part of the story.

With either bright or brushed Nickel-Chrome Plating, you get a rugged, durable finish that resists abrasion and wear . . . shrugs off the nicks and scratches of everyday use. And it offers outstanding protection against corrosion, resists staining and is easy to clean.

It's practical, too, from a production stand-point. Ovens and ranges, refrigerator doors, air conditioner grilles . . . virtually any major appliance . . . can be given a fashionable, two-tone beauty by contrasting bright trim and brushed panels. The same effect can be obtained by combining both of these finishes on the same part with selective buffing.

Either way, the long-lasting beauty of Nickel-Chrome Plating can help boost the sales of your appliances. For information on the durability of modern plating, write for our booklet *The Contribution of Nickel and of Chromium to the Durability of Decorative Plating.* A copy is yours for the asking.



Easy-to-clean oven liner is bright Nickel-Chrome plated. This mirror-like surface resists pitting, chipping and staining.

The International Nickel Company, Inc.
67 Wall Street INCO **New York 5, N. Y.**

Inco Nickel

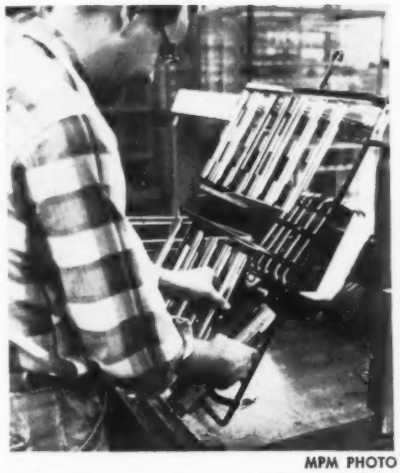
Nickel makes plating perform better longer

Circle No. 327 on Reader Service Card.

A compact, versatile finishing system for typewriter parts

ROYAL MCBEE PHOTO

Proof of skillful organic finishing and plating techniques is the finished product — the Royal Futura portable typewriter.



MPM PHOTO

Parts to be painted are carefully loaded on racks. The racks are then hung on hooks suspended from a 3-in. monorail conveyor.

AN MPM STAFF FEATURE

TYPEWRITER PRODUCTION at Royal McBee's Springfield, Mo. plant is a complex yet orderly operation. A feature article in the April 1961 issue of MPM described how a maze of overhead conveyors having a total lineal footage of almost 2½ miles provides a smooth flow of raw and finished parts from department to department. Major fabrication and assembly operations were also highlighted.

Space available in that issue did not permit coverage of the firm's equally impressive finishing facilities, which include electrostatic spray painting, plating and some barrel finishing.

As described in the earlier article, Royal's plant layout and conveyorization are designed for close compatibility with the actual production sequence. This concept carries through to the finishing system.

The finishing area is located in the center of the rectangle-shaped building. Parts leaving the screw machine or blanking area are conveyed directly to the finishing area. In some cases, secondary press operations, machining, welding or sub-assembly operations precede finishing.

From finishing, most painted parts go directly to final assembly, while most plated parts are fed to the finished parts stockroom.

Organic finishing

Versatility and compactness distinguish Royal's organic finishing system. The centrally controlled system is confined in a space measuring only 60 by 100 feet. Included in this area are two ovens — a 24-ft prime bake unit and a 49-ft finish bake oven — and 20 and 30-ft electrostatic painting stations. Eleven colors can be applied to a variety of types and sizes of parts.

Parts are transported to the load station of the finishing system and hung on hooks suspended from a 3-in. monorail conveyor. The hooks are spaced about 24 in. apart.

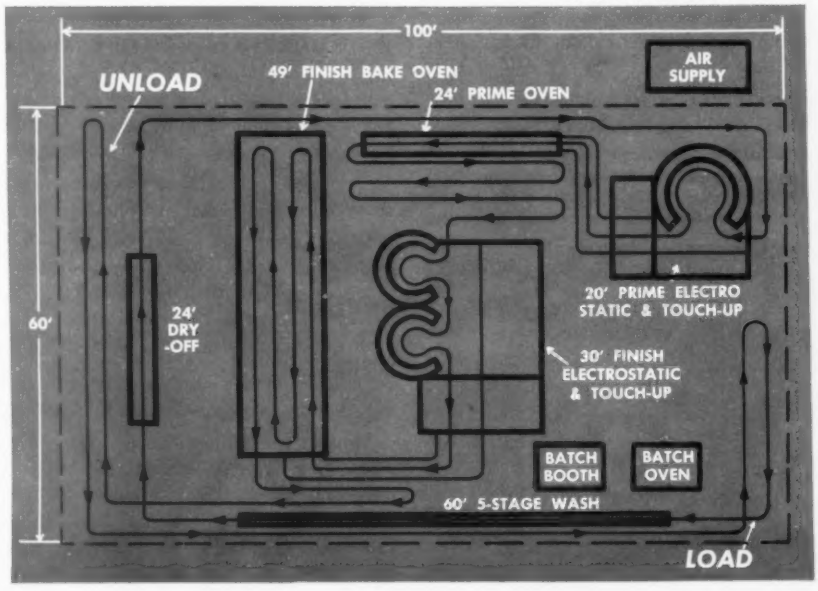
The monorail conveyor carries the 20-lb capacity hooks through the finishing system at speeds of 4 to 12 ft per minute. Normally, the elapsed time for a complete cycle is about 160 minutes.

In sequence, the parts travel through a five-stage phosphatizing machine, dry-off oven, prime electrostatic booth, water-wash touchup spray, four-minute accelerated prime oven, two-coat electrostatic unit, another touchup booth, and then through a tunnel to the large finish bake oven. The parts are atmosphere cooled while travelling from dry-off to finish painting.

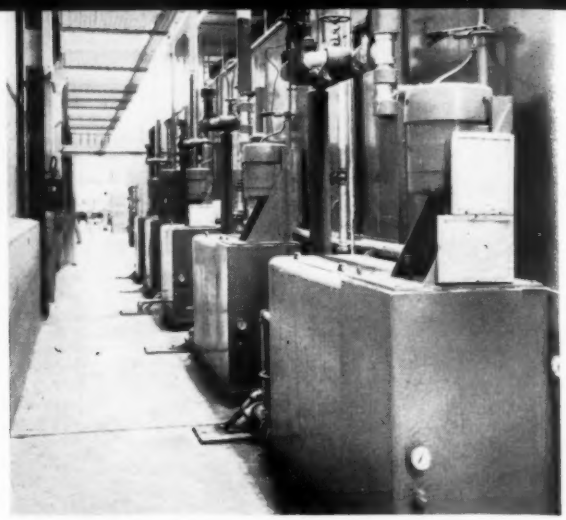
Both electrostatic stations in the system — the single prime unit and double-finish unit — are designed with pit-mounted reciprocators. The prime coat

Flow Diagram of Organic Finishing System

DRAWING COURTESY THE R. C. MAHON CO.



(Left) — Parts enter 60-ft, five stage phosphatizer.



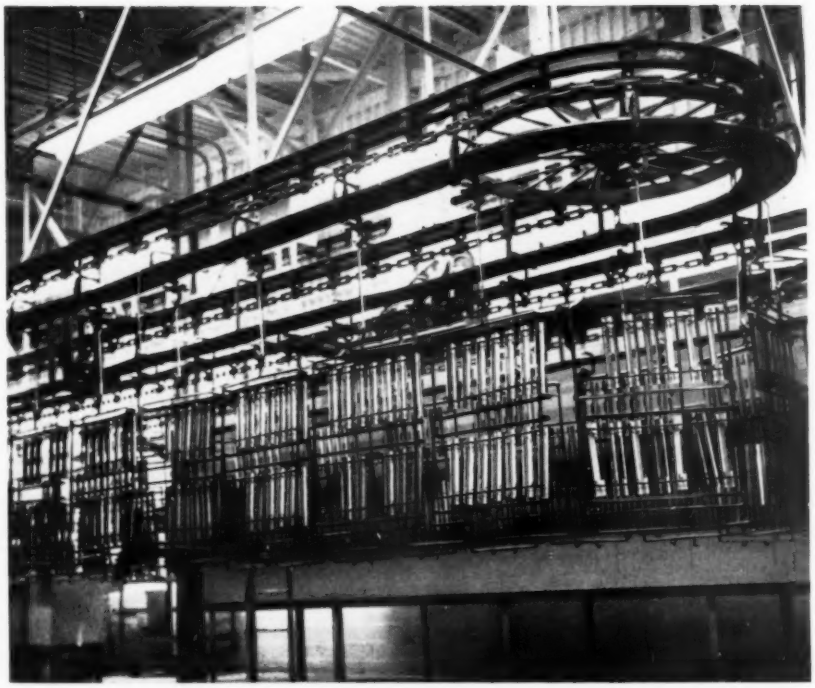
(Right) — Side view of phosphatizing machine shows tanks, valves, piping and instruments used to control the process.

oven is electrically heated to approximately 190 F. The two-zone finish bake oven is gas-fired and normally completes a baking cycle in 50 minutes. The first zone is heated to 260 F and the temperature in the second zone is boosted to 300 F.

Each of the spray booths is equipped with 5 or 10-gal. tanks containing the 11 standard colors which are applied. Color changes are made quickly: the hose leading to the spraying head is disconnected from a tank, connected to a solvent tank, and the solvent is circulated through the system; the system is then purged of the solvent and the hose is connected to another paint tank. The entire color-switching operation takes approximately three minutes.

Paint colors are regularly checked with test panels to maintain the correct shade. The finishes are applied in thicknesses of 1 to 2 mils (3.5 mils for wrinkle finishes).

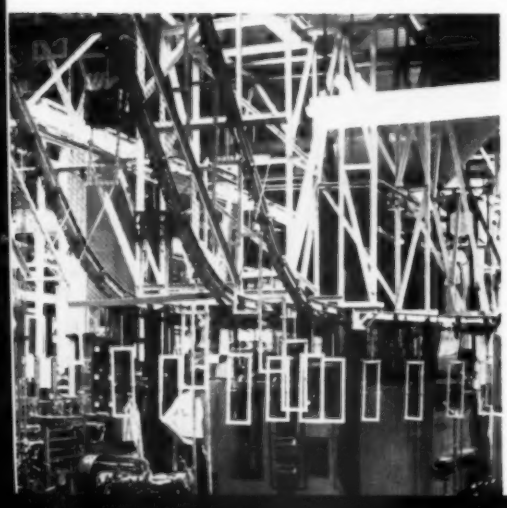
The entire organic finishing operation, including conveyor starter motors, temperature recorders, etc., is controlled from a central panel by one operator.



Parts leaving 24-ft prime bake oven (rear) are air cooled before entering finish spray booths.

MPM PHOTOS

One of two automatic plating machines in operation at Royal. By use of dial settings on the rack hangers, the operator is able to use any one of four different plating sequences.



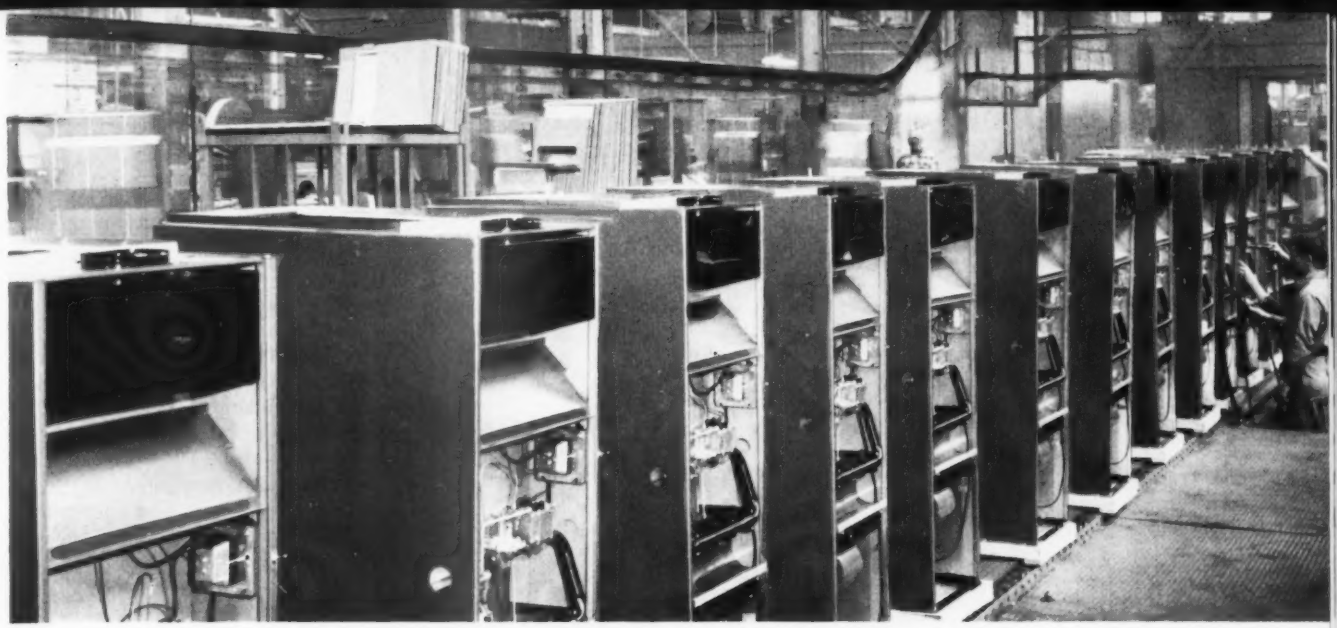
Other equipment in the paint finishing system includes a batch spray booth and batch oven, a stripper line consisting of two stripper tanks, two rinse tanks and a rust preventive dip tank with exhaust facilities.

Plating operations

More than 200 different parts are plated in an area adjacent to the organic finishing system. Two automatic plating units and a barrel plating installation are used. Nickel, nickel-chrome and bright and black zinc are applied.

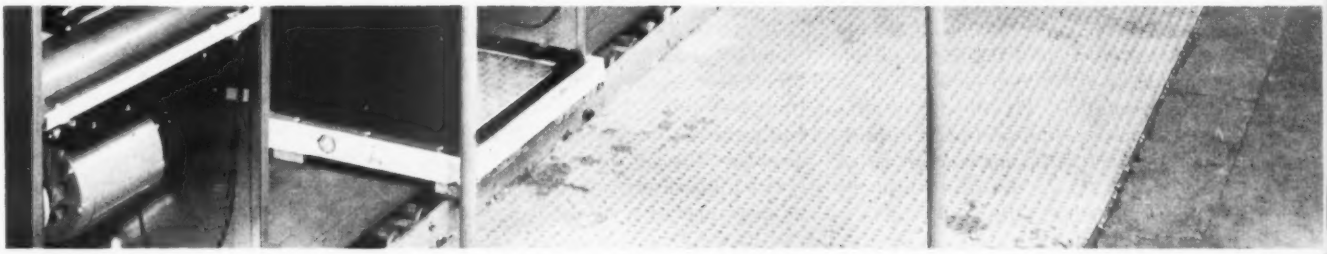
One of the automatic units is used for applying zinc and the other handles the nickel and nickel-chrome. Flexibility is provided in the plating operations by a system of "dial settings" on the rack hangers. By pre-setting these dials (or "flags") the operator is able to employ any of four plating sequences.

Dials on the racks are set in appropriate positions so that switches are tripped or bypassed as the racks travel over the plating tanks on a monorail conveyor. Thus, depending on the particular sequence set up by the dial settings, racks dip into or pass over individual tanks. _____MPM



Coordinating quality control for twelve plants

Rheem finds a quality control system that works and spreads it through its Home Products Div.



View along final assembly line for warm air central heating units. Each assembly man on the line is also a quality control inspector.

EACH OF THE 12 PLANTS comprising Rheem Mfg. Co.'s Home Products Div. operates separate quality control staffs and handles education in connection with other phases of the program. This education includes contests, department meetings, surveys of customer reactions, and combined meetings between production, quality control, and engineering for a study of field service reports.

The quality control coordinator for the Rheem Home Products Group reports to the Group vice president and general manager, Vearl J. Heinis. With the concept that quality must be "built into a product," it is interesting that Rheem has no "line inspectors." Each plant has its own quality control manager, and under him is a group of roving inspectors who are on call at any time from any spot on the production line, to aid the foremen of production. Each man on the production line, regardless of the department, is directly responsible for the inspection of the operation under him. In the event that there is difficulty or question with respect to the passing of any operation or component, he advises his foreman and the foreman, in turn, will normally call on one of the roving inspectors for a check.

Another interesting point in the organization is the fact that the quality control organization, through its manager at any individual plant, reports directly to the plant manager. The quality control coordinator on a national basis, therefore, works directly with 12 plant managers, with the top responsibility for any individual plant resting in the hands of the plant manager himself.

Quality control responsible for standards preparation

In one specific plant, for example, where water heaters and contract tanks are produced, the quality control group consists of a manager and six inspectors. This group handles all of the quality control for 400 employees.

Included in the responsibility of this quality control group is the preparation of standards and procedures covering all operations. Each first line production supervisor, plus the engineering depart-

Final assembly and inspection line for gas-fired water heaters. The model shown is the 30-Plus "variable input" design.

ment and purchasing department, is furnished with copies of this material in booklet form. One of the six inspectors functions as a receiving inspector of incoming materials; the others cover the plant from metal fabrication to packaging. As indicated, this quality control staff reports directly to the plant manager through the quality control manager.

The term "roving" inspector is literal, in that the five inspectors who work along the line advise the foreman of the department in the event they find any irregularity along the production line. However, the quality control inspector does have the authority to stop the line if there is a discrepancy that will affect ultimate operation of the end product.

Pride on the production line

Rheem executives find that one of the outstanding results to come from the quality control system is that the production line worker has a new pride in his work and feels his responsibility to a far greater degree than before the system was inaugurated.

This also gives literally 100 percent inspection in that each workman is inspecting his own operation 100 percent and, at the same time, is inclined to keep an "eagle eye" on the operation immediately preceding his.

When a deviation from the standard procedure is reported to the foreman, action is taken immediately, and the action is then reported back to the man on the line. This has a good by-product of greatly improving the relationship between the line operator and his foreman. Rheem has found that this system makes it both easy and attractive for everyone involved in the manufacturing procedure to "live what is preached" on quality.

Quality control inspection and purchase specifications

Rheem has set up a control sheet based on military standard 105-A, with which manufacturers in the appliance industry who have served the military

SAMPLE SIZE CODE LETTERS
Inspection Levels

Lot Size	I	II	III
2 to 8	A	A	C
9 to 15	A	B	D
16 to 25	B	C	E
26 to 40	B	D	F
41 to 65	C	E	G
66 to 110	D	F	H
111 to 180	E	G	I
181 to 300	F	H	J
301 to 500	G	I	K
501 to 800	H	J	L
801 to 1300	I	K	L
1301 to 3200	J	L	M
3201 to 8000	L	M	N
8001 to 22000	M	N	O
22001 to 110000	N	O	P

MASTER TABLE FOR NORMAL INSPECTION (SINGLE SAMPLING)

Sample Size Code Letter	Sample Size	Acceptable Quality Level 0.10 AC RE	0.25 AC RE	0.40 AC RE	0.65 AC RE	1.00 AC RE	2.5 AC RE	4.0 AC RE
A	2							
B	3							
C	5							0 1
D	7						0 1	
E	10					0 1		
F	15							1 2
G	25				0 1		1 2	2 3
H	35			0 1		1 2	2 3	3 4
I	50		0 1			2 3	3 4	4 5
J	75				1 2	3 4	4 5	6 7
K	110	0 1		1 2	2 3	4 5	6 7	8 9
L	150	0 1	1 2	2 3	3 4	5 6	8 9	11 12
M	225		2 3	3 4	4 5	8 9	11 12	17 18
N	300	1 2	3 4	4 5	5 6	10 11	14 15	20 21
O	450	2 3	4 5	5 6	7 8	14 15	20 21	29 30
P	750	3 4	6 7	8 9	11 12	20 21	31 32	45 46
Q	500	5 6	9 10	13 14	18 19	35 36	56 57	81 82

RHEEM MANUFACTURING COMPANY
RECEIVING INSPECTION PLAN

Part Name Thermostat, E. W. H. (Source 1) (Source 2) No. 2276 AP-2277 2278

A. Q. L. Major .65 - Minor 4.0 Mil Stan 105A

Lot Size Inspection Level II

Test Fixtures High Voltage Potential Test Equipment

Points and Methods of Tests

Major: 1. 1100 Volt High Potential Test

2. Temperature Indicator Dial Installed Properly

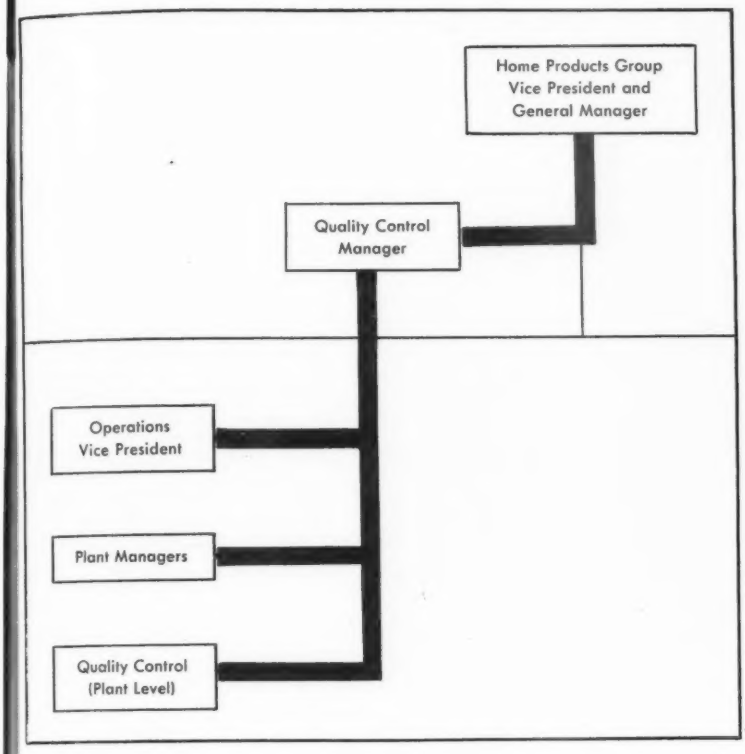
Minor: 1. 29/32" & 2" Dimensions 2. Threads

3. Temperature Setting (150°) 4. Type Screw

5. Condition of Body and Metalcal

Comments High Potential Voltage Test is performed on the Production Line.

Min. life 30,000 contacts.



"Quality control is a *top management* function, not just a name on the organization chart."

Fire testing a "Rheemglas" gas-fired warm air central heating unit. Flexible tube and electrical connections supply gas and current on moving conveyor. Checks include pilot, thermocouple, and solenoid-operated main gas valve.

are familiar. It covers lot sizes for the determination of the sampling and acceptance and rejection level for the individual shipment.

This form provides for differentiation between major and minor points of inspection. In the gas heating business, for instance, a leak in a gas valve would be considered a major point; a paint scratch, from an appearance evaluation, would be considered a minor point.

Vendors participate

When a receiving form is made up for a new product, material or component, it must go to the approved vendors for acceptance before it is placed in use. This system has proved invaluable in that the experience of the vendor is included in the overall inspection picture. For example, in some instances tolerances have been specified that were not required for practical operation. In a case such as this, the vendor feels free to suggest changes to the engineering department that can be made without sacrificing quality.

The data resulting from the use of these forms is valuable for the purchasing department, in that quarterly it shows the exact status of comparative vendors on a single product. Purchasing can then give consideration to those vendors showing improvement in quality and advise any vendors whose quality standards have shown a drop.

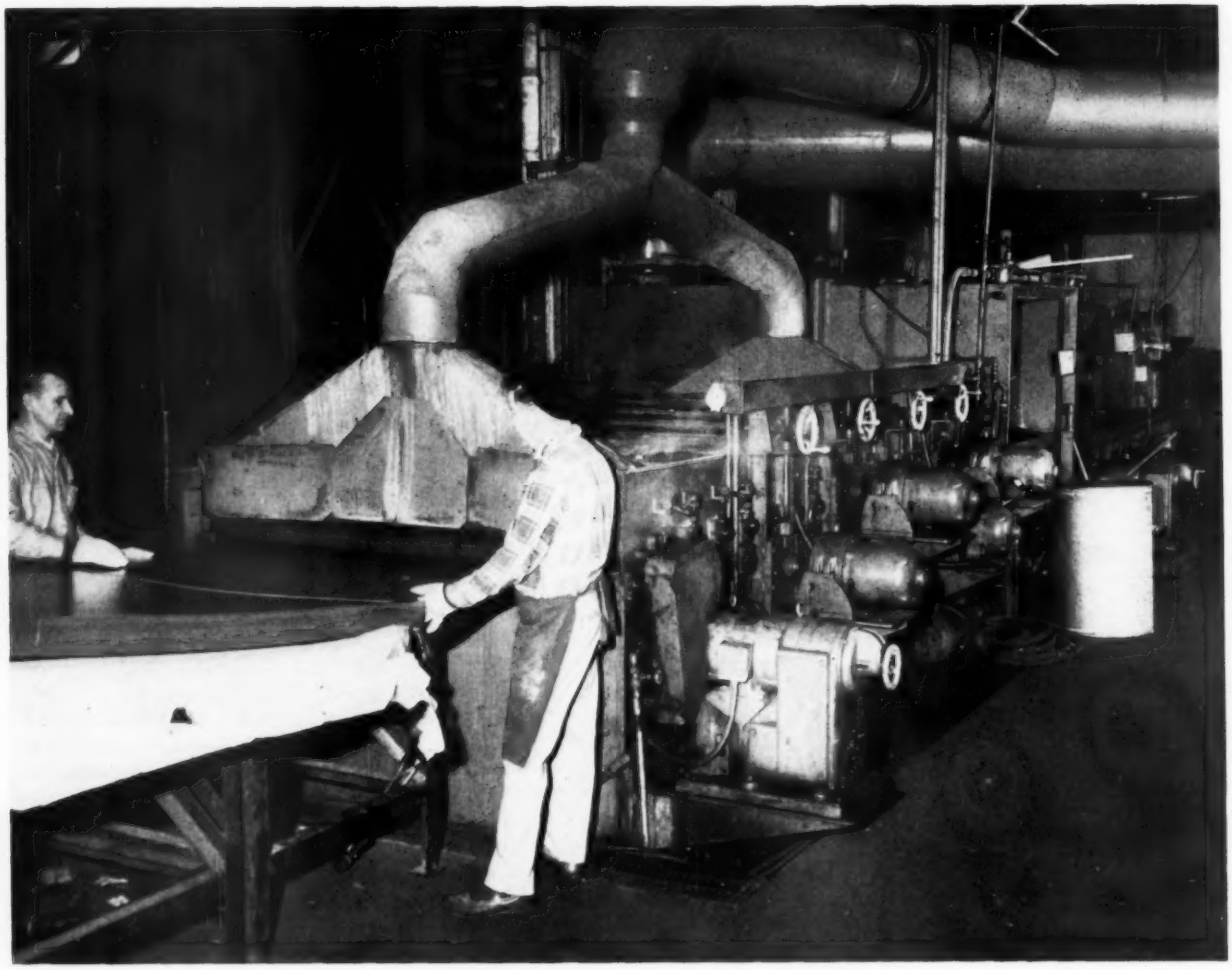
Each individual plant manager has available at the end of each month three sets of reports: field service reports, reports from salesmen (relating to quality), and a field failure report which includes (a) manufacturing defects, (b) in-transit damage, and (c) failures within the warranty period.

Once these reports are brought together, the quality control manager for a plant makes a complete study to determine whether or not there is a critical situation related to any product or operation. If there is such a situation, quick action is taken to avoid repetition. In the absence of a critical situation, information is used to develop a consolidated report to the plant manager. A review of this consolidated information is presented to line foremen for each department, irrespective of whether it shows good results, average results, or poor results. Good or average may end with a logical discussion of the data with the foreman. In the event there is a bad report, the entire group within a department will be called together in a meeting for a discussion of remedial plans. This discussion group includes the workmen on the line, the foreman, the individual plant quality control manager, and the plant manager.

A sound-test room for heating equipment provides a check for quiet operation of the blower. This room straddles final assembly line.

The consolidation of this report information for the 12 plants involved is made in the office of the Rheem quality control coordinator for the Home Products Group in Chicago. He has the benefit of two sources of information, the material just referred to as emanating from the plants and covering unit production, plus reports from the plant accounting departments relating to dol-

TO PAGE 51 →



How Kaiser reduced bathtub scrap from 7 to 1 percent

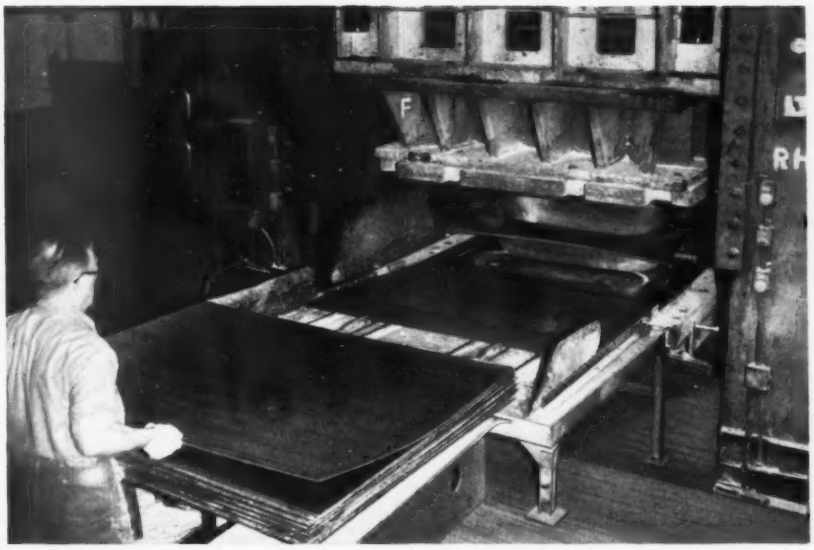
AN IMPORTANT PART of the production for Kaiser Metal Products Co., Bristol, Pa., consists of bathtubs, sinks and metal cabinets. A few months ago scrap loss on the more severe draws (bathtubs) was running as high as seven percent. As a result, an investigation was started to determine the changes in dies, equipment and materials which might be required to minimize scrap losses.

The bathtub was the logical product for investigation because it presented the most difficult drawing requirements and showed the highest scrap loss. As a result of the investigation, minor changes were made at the press, the drawing medium was changed from an oil-type

(Above) — This installation applies dry-type drawing compound to all blanks for bathtubs, sinks and cabinets. A split tank makes it possible to apply a different weight of compound to blanks for deep draws and those for cabinets.

(Left) — Steel rolls employed in roll-coat applicator are machined to provide uniform application of the drawing compound, irrespective of surface irregularities in the blanks.

In bathtub production, blanks are deep-drawn in the 1800-ton mechanical press (foreground). Other presses in the line accomplish the following operations: flange three sides; form the grab rail (front) flange; return-flange grab rail; and pierce overflow and drain holes.



As a result of the semi-automatic handling of draw lubricant application and the employment of this automatic press feeding equipment, five men were released for other plant operations.

through a change in materials, equipment and processing, production was increased and labor and material costs reduced

lubricant to a "dry" drawing compound, and changes and modifications were made in the drawing compound application equipment.

The company uses 14 gauge, deep drawing quality steel for bathtubs and sink tops.

At the draw press, it was found that in order to keep the stock from wrinkling at the ends of the tub, excessive hold-down pressure was required. This resulted in a percentage of scrap from cracking and breaking near the end of the draw. To eliminate this problem, beads were put in the die to better control the metal flow throughout all areas of the tub. When the beads were put in the dies, it was found that no changes were necessary in the die setups for shallow tubs or for 42-inch and 54-inch sinks.

Early in the program, difficulty was encountered in drying a sufficient coating (drawing compound) on the blanks. The pre-heat interval allowed in the wash and rinse sections was too short to allow the heavy gauge stock to enter the compound application section at the proper temperature. Also, the dry-off section was so short that the blanks were allowed only a few seconds to dry. The dry-off oven was modified through an extension to permit a greater dry-off interval. In addition, gas jets were installed to increase the oven temperatures.

A roll coat applicator was installed in the equipment. The steel rolls used were machined so that the compound could be coated uniformly, irrespective of slight surface irregularities in the blanks.

A "dry" lubricant was selected for excellent "slippage" properties, and the material and equipment matched to a point where the blanks could be thoroughly dried to obtain maximum adherence. Another requirement was that the lubricant should permit the metal to move freely in the draw die, as the control of movement in the metal for the deepest tubs was considered very important.

All blanks for the bathtubs, sinks and cabinets are now processed through the applicator. Another modification in this equipment was the dividing of the applicator tank into two sections. One section carries the dry drawing compound in a concentration of 15 oz. per gallon, and this is used in coating all tub and sink blanks. The other section carries a concentration of 10 oz. per gallon for use in coating all cabinet blanks. A simple valve control is used for switching from one tank section to the other.

Plant executives at Kaiser Metal Products are pleased with the results of the test program and the modifications as outlined, and report the following advantages: (1) As a result of equipment modifications and the fact that the blanks can now be handled into the press automatically, five men were shifted from the tub line to other operations. (2) Bathtub scrap was reduced from approximately seven percent to less than one percent. (3) Total costs for the application of drawing compound were reduced. (4) Die maintenance was reduced. (5) Reduction in blank size for the deepest tub draws resulted in material savings.

Completely formed tub sumps are transported by an overhead chain conveyor to fabrication assembly (welding) preceding the metal preparation and porcelain enameling operations.

Outside surface of double-walled panel showing three perforations.

Inside surface of same panel, showing traces of soldering flux residue.

A simple method for eliminating soldering flux corrosion from stainless steel products

CURRENT EXPERIENCE indicates that metal fabricators who use highly corrosive soldering fluxes on stainless steel often lay the foundation for product failure resulting from corrosion. This results from neglecting a simple post-soldering cleaning operation or using an ineffective cleaning method. The corrosion properties that make the flux effective also lead to failure through corrosion — but only when the flux is not thoroughly removed after the operation.

Chlorides cause corrosion

Most fluxes used for stainless contain hydrochloric acid and zinc chloride. Chlorides left on the surface after soldering can cause corrosion and rust. Removal of flux-caused deposits is an absolute must. At best, the flux leads to surface discoloration. At worst, perforations through corrosion result.

Despite the obvious nature of the problem and the simple corrective measures, soldering flux failures involving various grades of stainless in a variety of specific applications still occur, and are reported to be increasing.

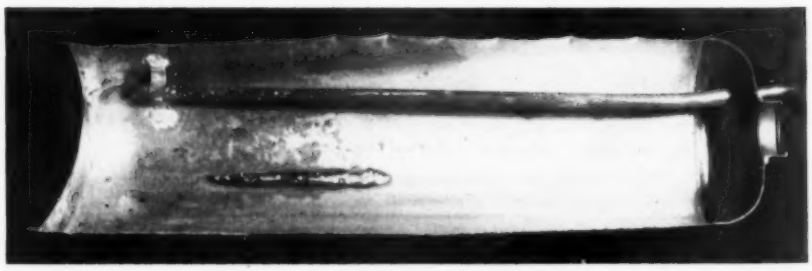
The case of the double-bowl sink

A double-bowl stainless steel sink is typical of the products causing trouble. In a typical case, the under surface of the sink "bowls" had been coated with a white, cork-filled insulating paint. Two perforations were visible, one on each bowl. The bowls were connected across the bottom by a stainless strip which had been soldered in place and painted.

When the insulating paint was removed, qualitative chemical analyses showed large amounts of chorides were present on the sink surfaces surrounding the soldered joints. Considerable rusting and pitting was found on the stainless surface beneath the paint. Two pits had progressed to perforation and several others were found in various stages of attack. No traces of attack or pitting were found on the bowl interior.

EDITOR'S NOTE: With the increased use of stainless steel for appliances and similar metal products, failures due to soldering flux corrosion are being reported in increasing numbers. Credit goes to John Halbig, senior research engineer, Armco Steel Corp., and Armco's corrosion laboratory for the case history information and the method suggested for correcting the corrosion problem.

Section of 24-inch stainless steel sprayer tank showing evidence of soldering flux corrosion.



Proper soldering flux cleaning technique involves using clean, *hot* water and a brush.

The double-walled cabinet

Another case involved a stainless steel cabinet. Five of the six sides were double-walled. One double-walled panel showed three perforations. Solder had been used to seal the edges of this panel. When the panel was removed to investigate the interior surface, flux deposit streaks were found. A large rusted area was also detected. Severe pitting occurred in the streaks. All indications pointed to the soldering flux as the cause. The manufacturer noted that a washing operation had followed the soldering operation. However, because of the double-walled design of the product, the ineffective operation was not noticed.

The stainless coffee maker

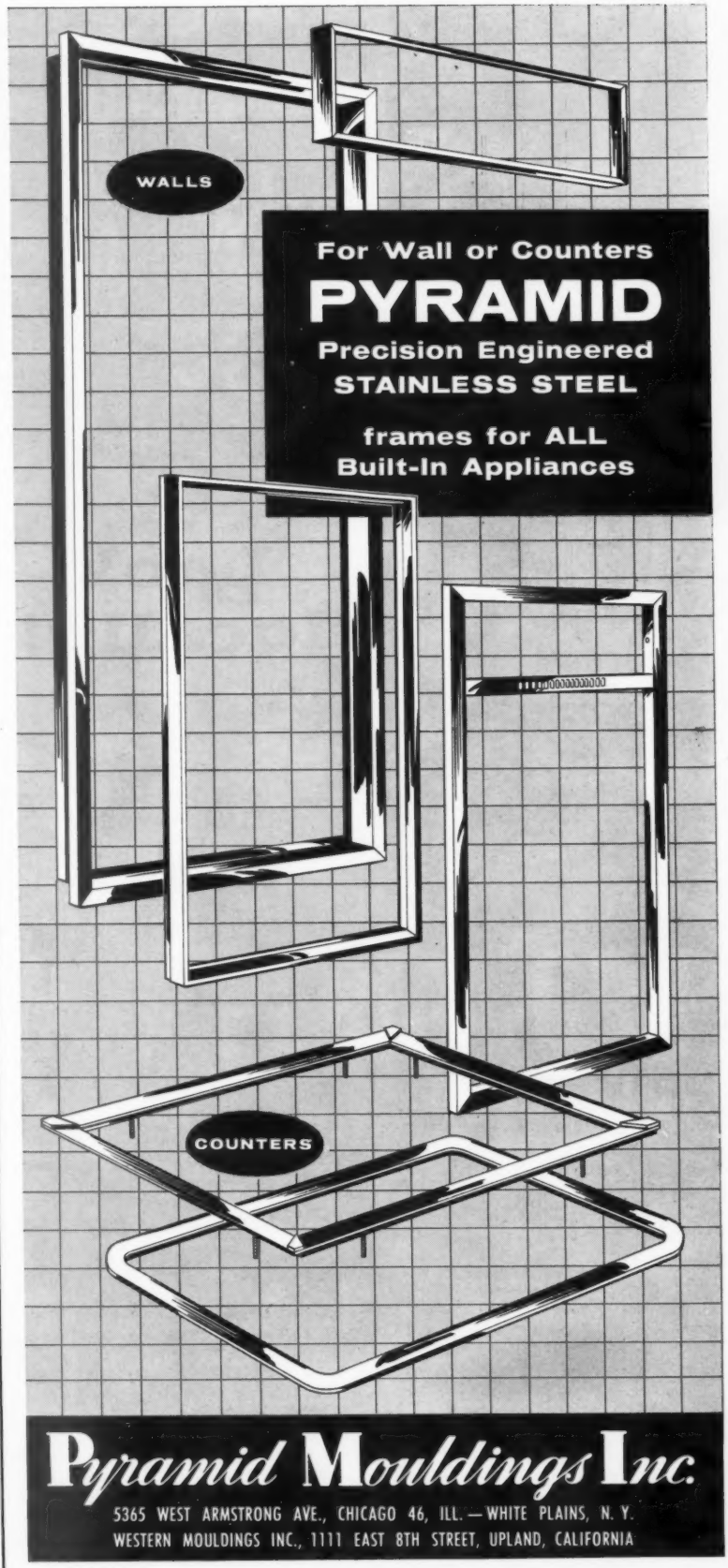
A similar failure analysis was run on a coffee maker which the manufacturer said had been properly neutralized after soldering. Further investigation showed that the ammonia solution used was not effective and that the failure was again caused by the flux. Studies on stainless steel spill trays, heater floats, gasoline tanks, water cans and other products have produced similar findings.

A simple, but effective cure

Although the problem can be a serious one, the solution is simple. The post-cleaning operation and not the flux is at fault. An ordinary scrub brush and plenty of *hot water* is all that is needed. A rinsing completes the operation.

The more complicated neutralizing process, involving ammonia or washing soda, is of itself not sufficient. These solutions will neutralize the free acid, but they also form salts in addition to those present. These salts are spread over a large area by the neutralizing process and can lead to pitting and rusting. Thorough water rinsing is *still* required.

It would seem to be up to the metal-working trade to implement the extremely simple, effective solution available.



Circle No. 341 on Reader Service Card.

If you're looking for the simple, economical way to meet your steel needs, it will pay you to *look locally* . . . to look to your nearest Steel Service Center. There you'll find:

PROMPT DELIVERY—usually from LOCAL stocks.

WIDE SELECTION—many types available from your LOCAL Steel Service Center.

FABRICATION ASSISTANCE—the right answers to your design and fabrication problems . . . supplied by LOCAL qualified specialists.

LOWER INVENTORY INVESTMENT—an expense borne instead by your LOCAL Steel Service Center.

STORAGE SPACE—also furnished by your LOCAL supplier.

Get in touch with your dependable LOCAL source for steel . . . your Steel Service Center. See your Classified Telephone Directory for listings.

Alan Wood supplies major Steel Service Centers with high quality plate, sheet and strip . . . chances are *your* Steel Service Center is among those we serve.

ALAN WOOD STEEL COMPANY

Conshohocken, Pa. • STEEL PRODUCERS WITH THE CUSTOMER IN MIND

DISTRICT OFFICES AND REPRESENTATIVES: Philadelphia • New York • Los Angeles • Boston • Atlanta Cincinnati • Cleveland • Detroit • Houston • Pittsburgh • Richmond • St. Paul • San Francisco • Seattle Montreal, Toronto and Vancouver, Canada—A. C. Leslie & Co., Ltd.

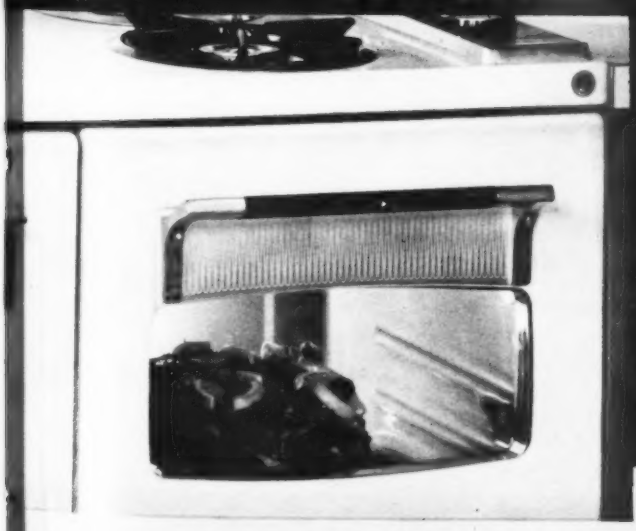
Circle No. 301 on Reader Service Card.

at **MILLS** Products, Incorporated

FOR PRODUCTON ECONOMY
in manufacturing –

FOR PRODUCT APPEAL
in sales –

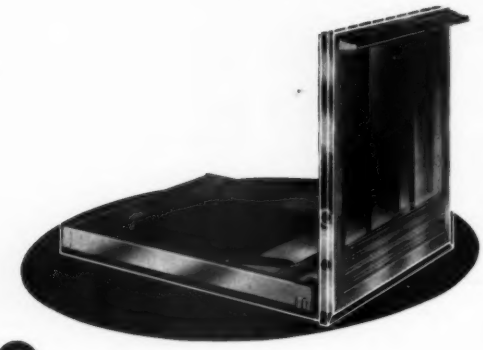
PERMA-VIEW®
Windows



PERMA-GRIP®
Handles

Pre-Engineered for PER-E

HERE'S NEW, SENSATIONAL CONVENIENCE--



1 **Door in closed position**

Glides easily and silently out of the way — UNDER THE OVEN.

Makes the oven completely acces— even all the way to the back.

Thus eliminating completely a—r-ever the hazardous and annoying—s-sity of reaching way over — or v—g to one side — of a hot oven doo—n-pletely and forever eliminates —e last inconvenient feature of —t conventional built-in ovens. Hou—es have wished for — and wi—w *DEMAND* this new *PERM-*—*Y* oven door.

2 **Door in conventional open position**

It's the

MILLS PERM-AWAY OVEN DOOR

Comes completely assembled — Door, Window, Hinges, Springs and Handle — and is so simple and easy to assemble to your oven — (you don't even need a screwdriver)—Just take PERM-AWAY out of our carton — insert it into the Wobble-Proof Track furnished with PERM-AWAY oven door. And — it's just as simple to service — pick it out — service — and set it back in — that's all there is to it.

Why continue with *OBSOLETE* Oven Doors when PERM-AWAY will boost your sales up and up and up! Any size — no tooling costs.

SIMPLE TO OPERATE AS 1 2 3

3 **Door in hidden recessed position**

MILLS *Products, Incorporated*

1015 WE— AR
WALLED L— A

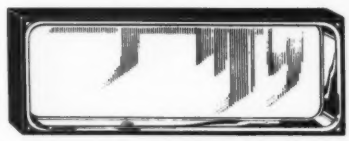
E-FECTION-PERFORMANCE-PROFIT

Make NO-FOG Visible Baking a feature of your range with . . .

PERMA-VIEW® WINDOWS

Mechanically sealed to prevent infiltration of vapors and to resist fogging

SQUARE



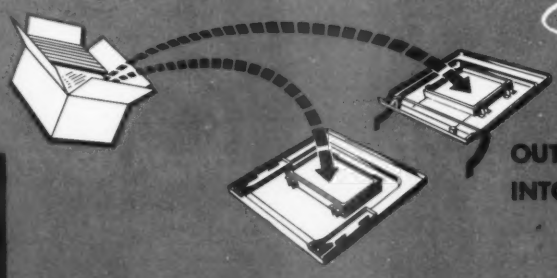
RECTANGULAR

TRAPEZOID

The demand for "visible baking" continues to grow. Mills "No-Fog" window is best and most economical answer to this demand. This is why a majority of manufacturers now use PERMA-VIEW windows to enhance the appearance, convenience and economy of their products. The PERMA-VIEW window comes ready for immediate installation in your range. Let our specialized production lines serve as your sub-assembly facilities to add this proven sales feature to your 1961 model ranges . . . free-standing or built-in!

DISPLAY THIS EMBLEM . . . THIS IS A GENUINE PERMA-VIEW NON-FOG

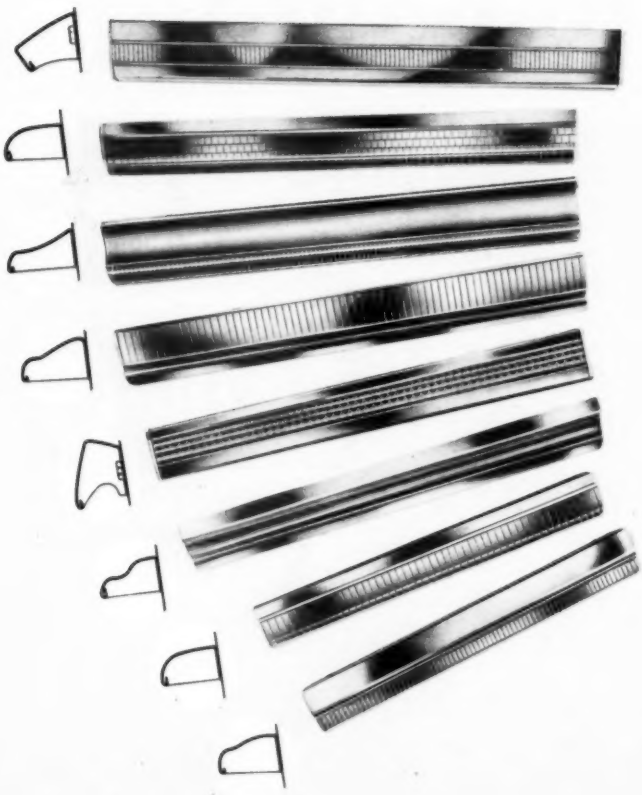
it assures your buyer of "No-Fog" Construction that Guarantees VISIBLE BAKING under all oven conditions



OUT OF OUR CARTON
INTO YOUR DOOR

NOW! 12 WAYS TO ADD *Beauty and Quality* TO YOUR RANGE

PERMA-GRIP® Handles



Mills Products, Incorporated offers you this selection of distinctive designs at standard production prices! Twelve standard models in six standard patterns are immediately available. All handles have plastic spacers which serve as a thermo-break. If your requirements are for custom handles, consult our engineering department for exclusive designs.

PERMA-GRIP handles are a quality product of our specialized equipment and skilled personnel. We can serve you as a sub-assembly facility quickly and economically!

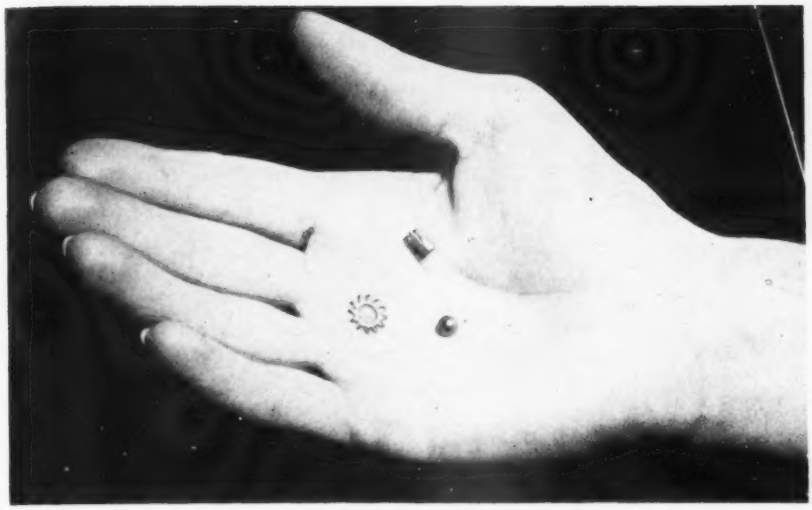
Out of our carton —onto your door

Mills Perma-Grip handles are fully assembled ready for installation on your assembly line.

LITHO IN U. S. A.

MILLS *Products, Incorporated*

1015 WEST MAPLE ROAD WALLED LAKE, MICHIGAN



The new warehousing facility stocks a wide variety of parts for the appliance, radio-television and Hotpoint divisions. Shown are the smallest; a lead clamp, a ball bearing and a lock washer.

An oil warm air furnace casing is one of the largest parts stocked in the warehouse.

GE streamlines spare parts distribution

55,000 different parts stocked at New Concord facility

A NEW $3 MILLION parts distribution center, built to support fast servicing of General Electric major appliances and TV sets throughout the country, was officially opened recently in New Concord, Ohio.

The new building contains more than 425,000 sq. ft. of warehouse and office space. Nearly 55,000 different parts — from tiny screws, nuts and bolts to complete combustion chambers for home furnaces — are stocked for GE and Hotpoint major appliances and GE television receivers.

Computer speeds orders

A computer is utilized to speed orders and maintain a perpetual inventory. Availability of items can be checked almost instantly with the input of a catalog number into the computer. Orders are fed into the computer which prints an acknowledgment, an invoice and a shipping memo — in addition to adjusting its inventory of the particular parts just ordered.

When inventories run low, the computer emits a warning to stock control personnel so that the needed parts may be reordered and restocked.

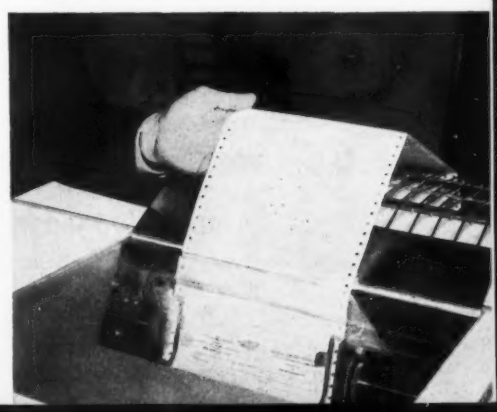
The printed shipping orders also contain a coded location reference for each part ordered so that the accumulation of each order is greatly speeded up in the warehouse.

The parts distribution center is tied in with GE's leased wire network so that it has direct communications to 230 GE offices across the country. Orders come in by teletype and on punched tapes, even during the night and weekend hours.

Orders received on tape may be fed directly into the computing operation. Those which come in by teletype — or in some cases by phone or mail — have to be transcribed onto punched cards. The computer then prints up the invoice, shipping memo and acknowledgment.

The computing operation accepts all orders and maintains inventory records for ten service shops across the country where refrigeration and air conditioning units are reconditioned. These shops teletype their daily production totals to the New Concord center at the close of each business day. These figures are fed into the computer which adjusts its inventory for these locations. By nine a.m. the following day, all required shipping papers, transmitted by wire, are at the

Orders are received either by punched tape or by teletype, phone or mail. The orders are then fed into the computer. (Below) — The data processing center prints up an acknowledgment, a shipping memo and an invoice.



are you a victim of the

"SILENT COMPLAINT?"

No indignant phone calls about chrome peeling off the faucets . . . no irate letters about ugly blotches of rust on the washer. Just a frown, a grim comment to a neighbor, a mental note to remember next time. Just a "Silent Complaint" and you lose a customer without even knowing it!

After a few years of service, will the finish on your products reflect the same quality, the same attention to detail, that sold your products in the first place? That's when customers put their heads together and damn or praise your company on the appearance and durability of the product finish.

MacDermid representatives have the metal finishing background you need to get the right finish on the right product. They draw from a "supermarket" of products to meet all your needs . . . and they're backed by one of the most progressive research laboratories in the industry.

Write Harold Leever, President, for full details on how MacDermid's know-how, broad product line and knowledge of all phases of metal finishing can help assure continually growing business for your company.

MacDermid
INCORPORATED
...right to the Finish!
WATERBURY, CONNECTICUT
Ferndale, Mich. • Torrance, Calif.

METAL CLEANERS • COPPER PLATING PROCESSES • DRY ACID REPLACEMENT SALTS • MACROMATE CONVERSION COATINGS • ELECTRO AND CHEMICAL POLISHES • BURNISHING AND OTHER METAL FINISHING COMPOUNDS

Circle No. 332 on Reader Service Card.

The data processing center also keeps a perpetual inventory on the stocked parts. By putting a catalog number into the computing machine, an operator can then determine the exact current inventory of that particular part.

The printed shipping memos are rushed to the warehouse by means of pneumatic tube.

(Below) — Accumulated orders are taken to the shipping dock and placed on waiting trucks. Sometimes the trucks are used for the entire route of the orders. In other cases, the trucks are used to transport shipments only as far as the nearby Columbus, Ohio airport.

service locations. The amount of orders passed on by New Concord are governed by the production and known inventory level of each shop.

In addition, the computer will automatically route a request for units from one location to the next closest location when the original shop runs out.

Analyzing service

The data processing center also is used to analyze service call data collected from 28 service districts which encompass 60 cities across the country. From this continuing analysis, company marketing officials are able to determine the impact of service on customers.

Each district is measured competitively on such factors as the sense of urgency and speed with which service is provided, its availability and the technical competence of servicemen.

The printed shipping memos for the New Concord facility are transmitted via pneumatic tube to one of two dispatchers in the warehouse. He notes their priority and passes them on to the accumulators. Their job is made easier by the coded location reference printed alongside each part ordered.

The center receives parts from many GE manufacturing locations and more than 1000 outside vendors. In most cases, renewal parts that come to New Concord must be individually packaged before they are placed in inventory.

Opened in 1946 in nearby Zanesville, the parts distribution center has grown steadily. About 325 persons are currently employed at the center.

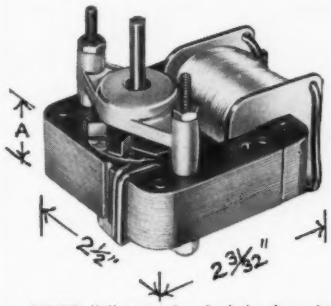
The Hotpoint Div. parts were added to the operation's responsibility just last year. The center itself is part of the Major Appliance Div. of GE. *MPM*

GENERAL INDUSTRIES

SMOOTH POWER

AC MOTORS

offer unmatched quality and dependability yet cost no more—often less!



MODEL "A" two pole, shaded pole motor available in various lamination thicknesses. Precision constructed for reliable, long hard usage. Perfectly balanced for smooth quiet operation.

MODEL	HP 2800 RPM	Locked Torque in./oz.	Max. Torque in./oz.	Free Speed RPM	A
A-3-CW A-3-CCW	1/450	0.7	1.1	3360	3/8"
A-5-CW A-5-CCW	1/170	1.8	2.3	3430	5/8"
A-6-CW A-6-CCW	1/130	2.2	2.9	3470	3/4"
A-7-CW A-7-CCW	1/100	2.5	3.4	3480	7/8"
A-8-CW A-8-CCW	1/80	3.2	4.5	3480	1"
A-9-CW A-9-CCW	1/70	3.7	5.3	3480	1 1/8"
A-12-CW A-12-CCW	1/60	4.5	6.5	3500	1 1/2"
A-14-CW A-14-CCW	1/50	5.0	7.0	3490	1 3/4"

Standard shaft diameter .1817, 1/4" shaft available if desired.

Standard Line From 1/1800 to 1/35 H.P.

See Our Catalog in SWEETS 7a-Gen (S) or write for copy

Quantity Price Quotation On Request

THE GENERAL INDUSTRIES CO.

DEPARTMENT GF • ELYRIA, OHIO

Circle No. 318 on Reader Service Card.

Wide versatility in mounting is a major feature of the new central system. For example, it can be mounted in a high boy system (as above) in such a manner as to allow the return air to flow into the lower side of the blower section and leave through the top of the heating-cooling section. The central system also can be easily installed in low boy, horizontal, counterflow or up-flow systems.

AN MPM DESIGN FEATURE

Cleaning home air electronically

new Honeywell unit desi

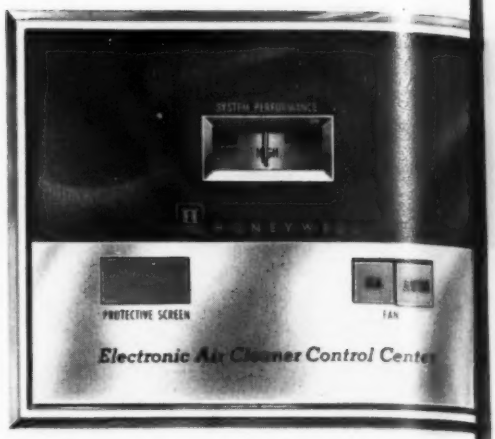
AN ELECTRONIC AIR CLEANER designed specifically for home use has been introduced by Minneapolis-Honeywell Regulator Co.

Based on the principle of electrostatic precipitation, the Residential Electronic Air Cleaner is installed in the ductwork of a heating, cooling or ventilating system. The unit is pre-wired and pre-assembled, and is quickly hooked up with minor modifications in ductwork.

According to company engineers, the air cleaner removes up to 95 percent of airborne particles which pass through the system.

The compact cleaner has a minimum thickness of 7 in., a total width of 22 in. and a total length of 31 in., including the door assembly and handle. The package is capable of handling a maximum of 2200 cfm at a minimum of 70 percent efficiency. It can be mounted in a horizontal, vertical or angular position with either a left or right return air flow.

The electrostatic precipitation principle works in the following manner: Particles carried in the circulating air enter the electronic air cleaner and are first given a positive electric charge. Carried along farther by the air stream, the particles pass into a uniform electric field induced between positive and grounded collector plates. Charged particles are diverted in the field and forced onto the collector plates.



The control center provided with the electronic air cleaning system is both decorative and functional. The panel can be mounted anywhere in the living area of the home. It tells the homeowner when the air cleaning cell requires washing, indicates that the unit is, or is not, operating properly, and also makes it possible for the homeowner to turn the heating-cooling fan on or off.

Five major components

The complete package includes five major components plus accessories. The components are the electronic cell, power supply, air-flow distributor, cabinet and protective screen.

The *electronic cell* is composed of two sections — the charging section and the collecting section — enclosed in a metal frame and protective screen. Electrical connection with the power supply is made automatically by spring-loaded contacts when the cell is in place inside the cabinet, and "power door" is closed.

Charging section of the electronic cell is a series of fine wire electrodes centered between grounded flat aluminum electrodes. In operation, the charging section generates an intense non-uniform electric field across the inlet of the electronic cell. Particles entering the field are given an electric charge which makes it possible to collect them efficiently.

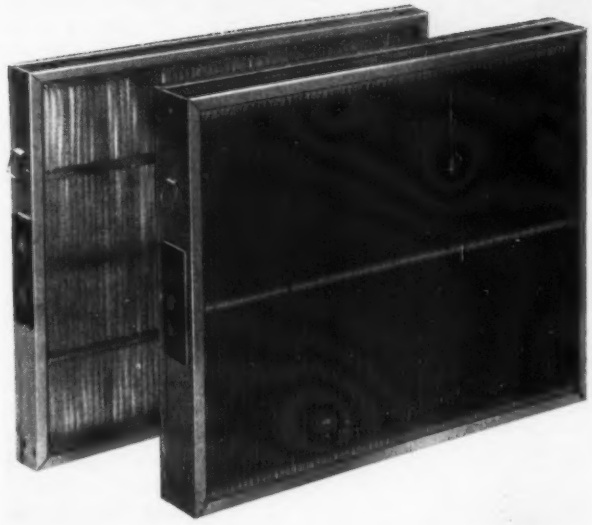
The collector section is a series of closely spaced flat plates which are electrified (positive and negative) to induce an intense, uniform electric field across the outlet of the electronic cell. In this field, the charged particles are deflected (accelerated along the field lines of force which are at right angles to the air stream) and forced onto the plate of opposite polarity.

To avoid premature arcing which tends to occur at the sharp corners on the collector plate, Honeywell makes the positive plates (every other plate shallower than most of the flat surfaces. Also, each collecting section is "burned in" (high voltage applied) right after assembly, which removes burrs and sharp corners of the plates to discourage arcing and ozone production in the finished cell.

The *power supply* of the air cleaner steps up and rectifies normal household electric service to provide 6000-volt dc. The circuit — including high-voltage transformer, selenium rectifiers and capacitors — is a conventional voltage-doubler rectifier circuit.

A feature of the power supply is that it is completely factory wired; only external leadwire connections to the air cleaner are made on the job. Whenever the "power-door" is opened, the line-voltage circuit is broken, and a grounding interlock short-circuits the power supply.

The *air-flow distributor*, a mechanical filter, is used to distribute the air flow evenly across the entire face of the electronic cell to increase efficiency. Company engineers point out that air velocity within a duct is never uniform throughout the duct's cross section. Usually it is highest in the center and considerably less at the edges. The faster the air passes through the air cleaner, the lower the cleaner's efficiency. Therefore, to clean a given volume of air per minute most efficiently, a uniform flow must be maintained.



(Above) — In the foreground is the three-inch, two-stage collector cell furnished as standard equipment; an optional add-on collector designed to provide increased air cleaning capacities is in the background. (Left) — Cabinet used with Minneapolis-Honeywell's new electronic air cleaning system can be installed in any type of forced air heating or air conditioning system. Only minor ductwork changes are necessary in comfort systems utilizing vertical, horizontal, angular or left or right air flow. Designed to provide direct reading of filter condition at cabinet location is the firm's Filter Flag device mounted on top.

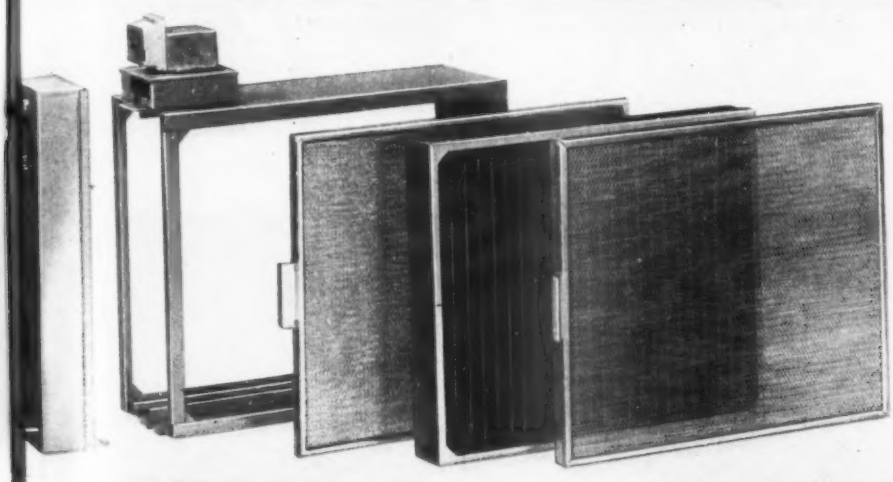
l uni designed for ductwork installation

The mechanical filter is located "downstream" of the electronic cell to resist the air flow and build up slight back pressures. This back pressure tends to divert air into the areas where flow velocity is least, and the air is distributed over the entire face of the electronic cell. Since the mechanical filter is downstream from the electronic cell, it seldom has to be cleaned.

All the air cleaner components are housed in the *cabinet*, which is adaptable for plenum or duct installation. The cabinet is flanged at inlet and outlet for butt or lapped connections. Clearance is required at only one side, for removal of the electronic cell.

A permanent *protective screen* stops large clumps of dust, animal hair, insects and lint from entering the electronic cell and thereby prevents clogging and arcing. Both the protective screen and the air flow distributor can be removed separately from the electronic cell for periodic cleaning, or left in place when the cell is removed for washing.

Air cleaner is made up of power door assembly, cabinet assembly frame with mounted clogged-filter indicator, protective lint screen, three-inch, two-stage air cleaning cell and an air flow distributor.



Standard accessories

Standard accessories in the air cleaner package include a control center, a Filter-Flag Indicator, and a washing kit. Designed for installation in the living area, the *control center* is a small panel which provides a fan switch and two indicators of the air cleaner's condition: a meter which measures power-supply primary current, and an indicating light for the Filter-Flag indicating circuit. The control center light indicates that some part of the air cleaner is clogged with dirt and needs cleaning.

The *Filter-Flag Indicator* is mounted on an electrical wiring box — either on the air cleaner or elsewhere. It is connected by a tube to the fan compartment of the furnace. Increased suction pressure inside the fan compartment, the result of dirt loading in the air cleaner, causes a red "flag" to appear in the front of the Filter-Flag Indicator, and closes a set of contacts which turn on the indicating light in the control center.

A *washing kit* is provided to clean the

TO PAGE 82 →

Pushing the buttons to start up the world's largest gas-fired continuous radiant tube furnace for the manufacture of water heaters at the A. O. Smith Corp. plant in Kankakee, Ill., M. E. Morgan (left), A. O. Smith vice president in charge of the Consumer Products Div., and F. S. Cornell, executive vice president, A. O. Smith Corp., Milwaukee.

To operate this automatic brushing and loading machine, the operator sets a tank on the pneumatic jack and simultaneously the inside of the tank's rim is brushed to prepare the surface for the welding of the head to the tank. Lifting the jack to place the tank shell on the conveyor belt is accomplished by pushing a foot pedal.

World's largest furnace for water heater tanks

new furnace for glass lining tanks at A. O. Smith Kankakee plant includes the latest design features

ON JANUARY 25, 1961 on the west side of the A. O. Smith Corp. plant in Kankakee, Illinois, a railroad siding ran parallel and adjacent to the building wall. In this exact location, just three months and six days later, on May 1, 1961, glass lined hot water heaters were being fired in the world's largest porcelain enameling furnace.

The furnace itself, a gas-fired, vertical, radiant tube straight-through type, was built entirely outside the existing building. It has an overall length of 225-ft, 3-in. Adjacent to the exit end of the furnace is a straight-through, forced air cooling tunnel, 90-ft long. With the conveyor extensions at the entrance to the furnace and exit end of the cooling tunnel, the entire installation is 385-ft long overall. The designed capacity of the equipment is 165 - 30-gal. hot water heater inner tanks per hour, or a gross load of 17,000-lbs. per hour. The equipment is capable of firing hot water storage tanks up to 36-in. diameter by 6-ft 8-in. long.

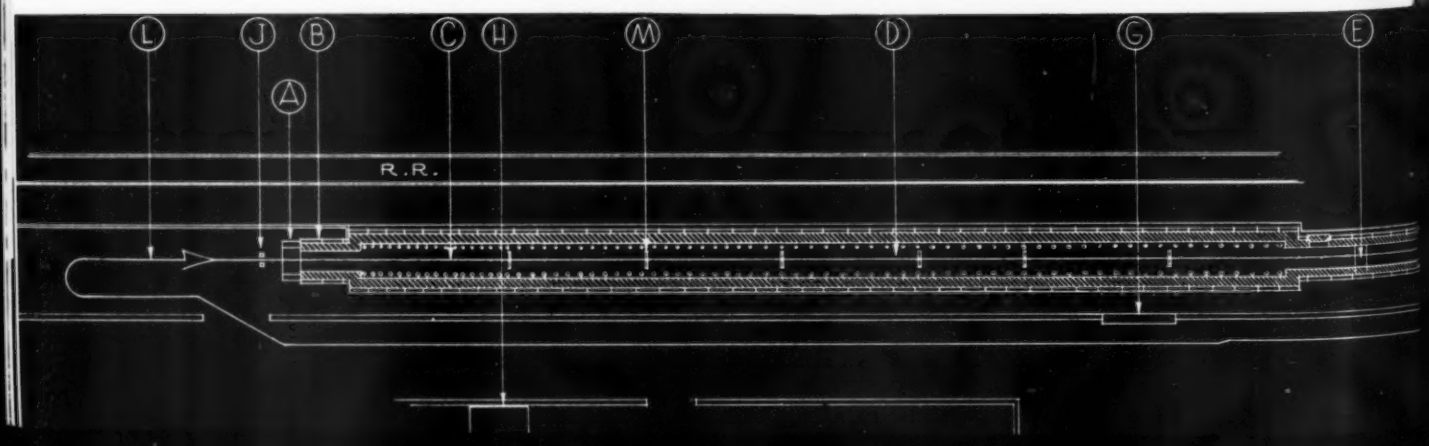
The general arrangement of the furnace and cooling tunnel, together with the furnace conveyor and auxiliary equipment, is as shown on the accompanying diagram. The entrance and exit air seals (**A**) are air curtains which effectively minimize heat losses from the openings at the ends of the furnace, through which the tanks being fired enter and leave. The exterior of each air seal is provided with split-type side opening doors which can be adjusted to any width of opening required for tanks of various diameters. The height of the opening can be adjusted by the use of removable baffles hung between the split doors. The maximum door opening is 3-ft 8-in. wide by 8-ft high.

Between the entrance air seal and the firing chamber is a 10-ft long unheated entrance vestibule (**B**). After passing through this vestibule, the heaters being fired enter and pass through the 22-ft long controlled pre-heat zone (**C**) where the temperature is raised, slowly and uniformly, to approximately 1000 F. In the succeeding six zones in the 130-ft long firing chamber (**D**) the tanks are raised to and held at 1630 F, the maturing temperature required for bonding the glass lining to the steel.

When the heaters emerge from the firing chamber, they pass through the 29-ft long slow cooling zone, in which is located the interior air seal (**E**) which seals off the cooling zones from the firing chamber. Following the slow cooling zone, the heaters pass through the forced convection cooling zone (**F**) which is 28-ft 3-in. long. In this zone air is circulated over the hot ware to promote faster, more uniform cooling. The heaters then leave the furnace, passing through the second, or exit exterior air seal (**A**), which is of similar design to that at the entrance.

To further reduce the temperature of the fired heaters, they immediately enter and travel through the 90-ft long cooling tunnel (**K**) where fresh air is continuously pulled in at the bottom, circulated over the tanks, and exhausted at the top by three 36-in. diameter duct fans, each having a capacity of 19,000 cfm. Interior baffles provide uniform distribution of the air within the cooling tunnel.

The heating system of the furnace, which has a total installed capacity of 26,000 cfh of natural gas, consists of 144 four-in.-diameter, thin wall vertical radiant tubes, located along both sides



of the controlled preheat zone (**C**) and the firing zones (**D**). The spacing of the tubes is graduated to give proper heat distribution through the length of the firing chamber. Each tube is equipped with a spin-type burner designed to give uniform heat release throughout the heated length of the radiant tubes. The burners are lighted by automatic spark plug ignition, which makes the lighting of the furnace a simple operation.

The temperature within the controlled preheat and firing zones is maintained within close limits by means of seven circular chart recording controllers. These instruments, together with all the electrical controls for the entire unit, are mounted in the specially designed control cubicle (**G**) which faces into the work area within the building.

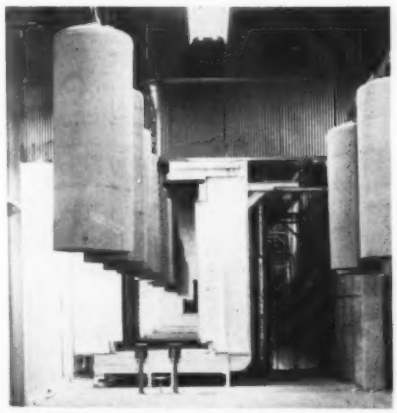
To prevent damage to the equipment and notify the operating personnel should a piece of ware fall from the conveyor within the furnace or cooling tunnel, two parallel light beams are projected just above the furnace floor from the light sources (**J**) located at the entrance end of the furnace to the electric eye receivers (**J**) at the exit end of the cooling tunnel. Should either one or both of the light beams be interrupted, an alarm is sounded and the conveyor is stopped.

To provide for control of the humidity within the firing chamber, a chilled air unit (**H**) is installed which can supply 48,000 cfh of 40 F dewpoint air. This low dewpoint air is piped to the firing chamber through any or all of the inlets (**M**) in the furnace bottom. Perforated plates over the inlet openings diffuse the low dewpoint air across the width of the firing chamber.

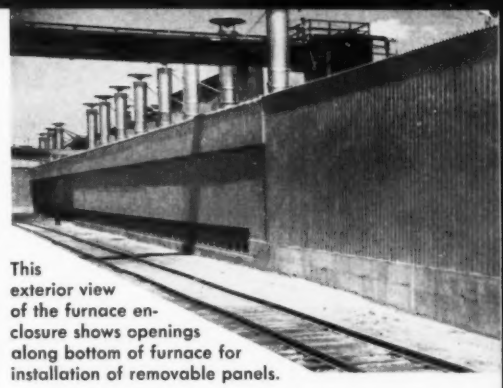
The location of the furnace and cooling tunnel outside the building presented the problem of protecting them from the elements. An aluminum roof was designed and installed over the area occupied by the furnace and cooling tunnel. This roof, which is designed to take care of its expansion and contraction, serves a dual purpose in that it not only serves as weather protection but also as an exhaust hood to remove excess heat and products of combustion from the area. Over the length of the furnace the roof has eight 32-in. diameter exhaust stacks, in each of which is a duct fan with a capacity of 12,500 cfh, or a total of 100,000 cfh.

The entire exposed side of the furnace is sheathed, on the outside of the buckstays, with 8-in.-pitch ribbed aluminum siding, except at the bottom. Here removable aluminum panels with louvered openings for the admission of outside air are installed. The enclosures around the conveyor extensions, at the entrance to the furnace and the exit end of the cooling tunnel, are made of the same type of siding so that the exterior presents a uniform and pleasing appearance.

The overhead monorail conveyor (**L**) is a standard No. 458 chain with trolleys on 24-in. centers. Each trolley carries an alloy drop rod which extends through the narrow slot provided in the roof of the furnace. Seal plates, carried by the conveyor, slide on heat resisting alloy tracks on the furnace roof to seal the slot opening. A continuous articulate load bar arrangement permits unlimited spacing of the heaters when hung on the conveyor.



(Left) — As the units are carried through the furnace, the 25 million Btu/hr heat, equivalent to heating 260 average-size homes, fuses the glass to the steel. Box-shaped units in foreground are light sources for electric eyes. The new furnace increases the plant's production capacity from 52,000 to 66,000 residential water heaters per month.



This exterior view of the furnace enclosure shows openings along bottom of furnace for installation of removable panels.

"This major advance in the automated production of water heaters will provide an extremely intense heat and controlled moisture-free atmosphere resulting in the most corrosive-resistant glass-fused-to-steel lining in the industry," M. E. Morgan, A. O. Smith vice president, stated.

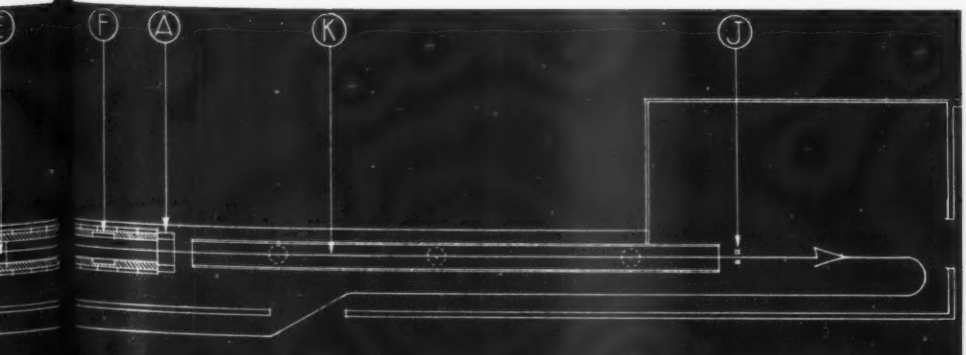
The new continuous furnace will increase the Kankakee production capacity from 52,000 to 66,000 water heaters per month. The facility offers the maximum in safety and comfort to production employees.

"As the largest manufacturer of domestic heaters — producing 600,000 units annually," Morgan said, "the installation of this furnace by the Consumer Products Division of A. O. Smith Corp. is another step forward in providing highest quality water heaters at equitable prices."

Although the entire industry produced about 3.5 million domestic water heaters last year — about 10 percent below 1959 — Morgan expects the industry to exceed the 1959 volume this year.

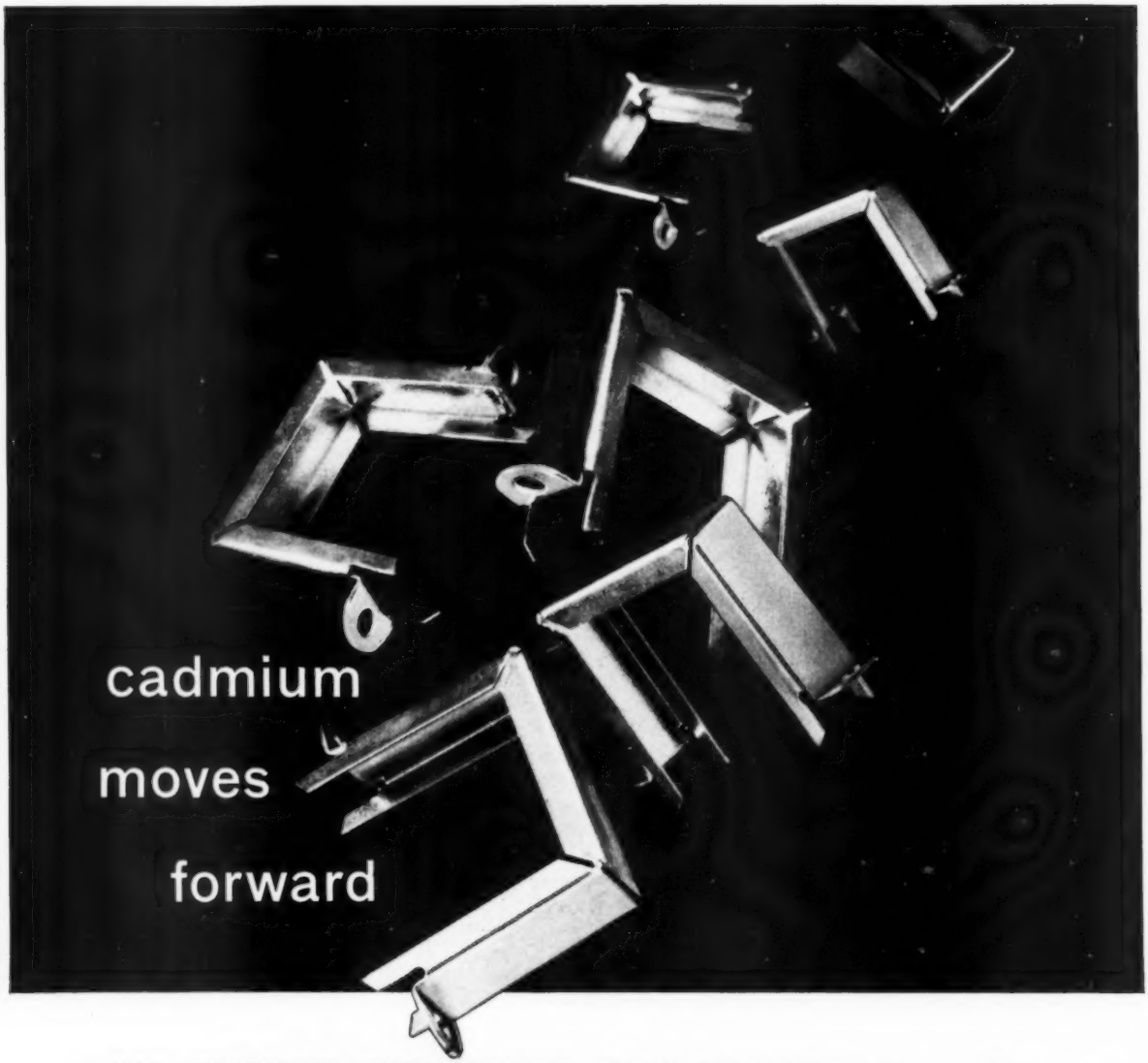
MPM editors extend credit to G. E. Dixon, plant engineer at A. O. Smith and J. M. Steele, project engineer, Ferro Corp., for the technical details included in this descriptive feature.

DRAWING COURTESY FERRO CORP.



FURNACE NOMENCLATURE

A	EXTERIOR AIR SEAL
B	ENTRANCE VESTIBULE
C	CONTROLLED PREHEAT
D	FIRING ZONES
E	INTERIOR AIR SEAL
F	CONVECTION COOLING
G	CONTROL PANEL
H	AIR CHILLER UNIT
J	ELECTRIC EYE
K	COOLING TUNNEL
L	OVERHEAD CONVEYOR
M	CHILLED AIR INLETS



...with FINEST FINISHING PROCESSES from Cowles

Your products gain the full benefit of cadmium corrosion resistance with Cowles cadmium brighteners. For truly bright finishes, even in low current density areas on intricate shapes, Cowles provides a simplified *sure* way to improve your cadmium plating results.

Cowles' complete plating services go far beyond cadmium brighteners. You can depend on Cowles products and processes for every phase of cleaning, phosphating, conversion coating, coloring and final protection. Your Cowles Technical Man can demonstrate immediate improvement in your own operation with Cowles Finest Finishing Processes. Take advantage of it — call Cowles today!

applications for all types of metals, equipment and procedures

- Cleaners — soak, barrel, electro and spray
- Phosphate coatings — crystalline and amorphous
- Brighteners for zinc, cadmium and copper plating
- Conversion coatings — aluminum, cadmium and zinc
- Protective coatings for all plated surfaces
- Foam blanket and surface tension fume suppressants
- Acid additives and salts
- Aluminum cleaners, etchants and deoxidizers
- Basic plating electrolytes
- Industrial cleaning and pickling chemicals

Cowles CHEMICAL COMPANY
CLEVELAND 20, OHIO

Circle No. 313 on Reader Service Card.

Quality control

→ FROM PAGE 33

lar value. The latter is the value involved in manufactured products reported with manufacturing defects, damage in transit, or within-warranty failures. This information is charted against overall service costs in the field.

Rheem stresses the importance of actual personal contact with distributors. Representatives make field tours and this field work has, in many instances, smoothed out what appeared to be a critical situation purely through educational efforts.

One point, for example, that was found to rate high on the complaint list was in packaging and marking of the product. Here, through a simple change in procedure, a great number of field complaints were erased immediately.

It has been found in some instances that complaints are magnified to the field salesman and this, being a serious problem for him, is fed into the plant information on a basis far beyond the actual status of the complaint. Field contacts tend to eliminate this procedure and, at the same time, improve relationships with the dealer-distributor and educate the salesmen concerning proper handling of complaints.

Rheem quality control reports show that during the past three years, the manufacturing defect field complaints per thousand water heaters produced have been reduced by 42 percent. Contract tank returns during the same interval have been reduced by 20 percent and air conditioner returns have been reduced by 65 percent.

Operating test for the "Rheemaire" air conditioner condensing units. Test stands are numbered one through eight. Ceiling-mounted air handlers are permanently installed. Insulated test room affords a wide range of humidity and temperature conditions. Quality control inspector is checking instrumentation which shows electrical and cooling characteristics.

A STATEMENT TO MPM EDITORS BY

Veard J. Heinis, *GROUP VICE PRESIDENT AND GENERAL MANAGER, HOME PRODUCTS GROUP, RHEEM MFG. CO.*

The philosophy for the quality control program of Rheem's Home Products Group has not changed since its inception as described in the December, 1957 issue of MPM, except that the original concept has been broadened and tightened.

Originally an underlying reason for the success of the quality control program was the basic philosophy of management that (a) people will do good work if they have support and appreciation of effort from all levels of management, and (b) no emergency can be great enough to justify "short cuts" through quality standards.

Quality cannot be inspected into a product — it must be *built* into a product. This has been the basic idea behind our broadened program.

Expansion of the program has been gradual and plant by plant. Originally we included four plants; Chicago; South Gate, Calif.; Sparrows Point, Md.; and Houston, Texas. About two years later three additional plants were added under the quality control setup, including New Orleans, La., and Richmond, Calif. (This included the tank plants at Richmond and New Orleans. The quality control setup covered the home products but not the extensive line of containers.) The third plant included in this addition was New Castle, Del., where convection type hot air home heating plants and hydronic units are produced. Later a Canadian plant at Hamilton, Ont. was added, and during the ensuing years additional plants were added to make a total of 12. These additions include Richmond Plumbing Ware at Metuchen, N. J. and Monaca, Pa., and the recently acquired Ruud plants at Kalamazoo, Mich. and Toronto, Canada.

With the coordinated program now operating in 12 plants, we are now in position to outline positive results as (1) increased employee morale, (2) increased production, (3) reduced scrap and rework cost, (4) reduced field service, and (5) an effective selling tool based on performance. MPM

Editor's mail

→ FROM PAGE 14

"thermosetting acrylic finishes." This makes definitions difficult. In the older, more scientific concept of thermosetting finishes, it would be reasonable to expect that the baked thermosetting finish would be insoluble in conventional solvents after baking. Some present day so-called thermosetting acrylic finishes can be removed from the metal after baking with the same solvents used in the enamel as supplied to the customer.

C. O. Hutchinson,
Manager Market Development
The Glidden Co., Cleveland, Ohio

Mr. Hutchinson's comment is appreciated by our editorial department. It serves to point up the problem of terminology in the organic finishing field. Terminology becomes increasingly complicated as new materials and processes are added to an already confusing situation.
The Editors

so new it hasn't even been "thought up" yet

Yes, it's the frit you need . . . because it's the frit you're going to describe to us. Tell us your requirements . . . the color, physical properties, application temperature and conditions . . . and we'll make it for you. However, in all probability you don't need a "new" frit . . . chances are that one of the many standard frits which we stock for immediate shipment will fill your needs. Ground coats, cover coats, one-coat enamel, acid resistant, low temperature, whites or a wide range of colors for steel . . . dry process or wet process for cast iron . . . we have 'em all. Apec is your complete source for stock or custom frit, and complete field service.

APEC
QUALITY FRITS

american porcelain enamel company

PHONE PO 6-4756 • 1285 KEATING AVE., MUSKEGON, MICHIGAN

Circle No. 303 on Reader Service Card.

MPM

personals

John S. Chamberlin has been appointed manager, product planning and market research of **General Electric's** Television Receiver Dept., Syracuse, N. Y. Also, **Robert F. Davis** has been named manager of sales in the department. He replaces **Joseph F. Effinger,** who has been placed on special assignments in the Syracuse headquarters.

Robert J. Bunting has been named **Kelvinator** product sales planning manager for refrigerators, freezers and ranges. He was formerly administrative assistant to the general sales manager.

Lawrence H. Baker has been appointed eastern regional manager for **Copeland Refrigeration Corp.** His territory will include metropolitan New York, northern New Jersey and New England, with headquarters in New Milford, N. J.

Peter G. Peterson has been elected president of **Bell & Howell Co.,** succeeding **Charles H. Percy,** who moves up to board chairman and chief executive officer.

Coleman Co., Inc. has elected **Jess L. Moore** a vice president. Continuing as general manager of the Heating and Air Conditioning Div., he supervises all engineering, production and marketing operations of the division.

Frank H. Post, vice president and general manager of **Robertshaw-Fulton's Robertshaw Thermostat Div.** since January 1956, has been named corporate vice president, marketing. He will be headquartered at the company's corporate headquarters in Richmond, Va. The company also announced the appointment of **Arnold C. Hansen** as general manager of the Thermostat Div. at Youngwood, Pa. He was formerly assistant to the general manager of the firm's Grayson Controls Div. at Long Beach, Calif.

HEINIS

GOODFELLOW

PAQUETTE

DR. KELLEY

V. J. Heinis has been appointed president and **E. F. Paquette** executive vice president of **Rheem Mfg. Co.'s** Home Products Group. Heinis had been vice president and general manager, Home Products Group, and Paquette had been vice president and general manager of the Rheem Container Div., Linden, N. J.

W. S. Goodfellow, who had been vice president, marketing, Container Div., has been promoted to vice president and general manager of the division.

Kenneth L. Kientz has been appointed manager of the Des Moines, Iowa factory branch of **Eureka Williams Co.** He was recently Eureka district sales manager in the Denver, Colo. factory branch.

H. W. Whitmore has been named director of engineering of **Friedrich Refrigerators, Inc.,** a subsidiary of Ling-Temco Electronics, Inc. The company manufactures refrigerated display cases and air conditioners. **Temco Industrial,** commercial products division of Ling-Temco, has announced the appointment of **Gary Evans, Jr.** as chief engineer. Among the products manufactured by the division are automatic dishwashers, central control systems for coin-operated laundries, and multi-load washing machines.

Byron H. Brown has been named assistant district sales manager for **Republic Steel Corp.** in St. Louis, where he will have charge of the company's Kansas City branch office. The company also announced the appointment of **J. D. Broadhurst** as assistant district sales manager in Cincinnati, succeeding Brown.

Dr. Maurice J. Kelley has been appointed director of research laboratories of **The Diversey Corp.** Before joining Diversey, Dr. Kelley served as director of the project coordination department and director of industrial specialists laboratories of Nopco Chemical Co.

C. J. Wires, Sr. has been appointed chief production engineer for Heating & Air Conditioning Div., **Iron Fireman Mfg. Co.** He has been associated with the division since 1948 as a draftsman, chief draftsman and project engineer.

W. M. Byrne has been named national sales manager of the **Westinghouse** Portable Appliance Div. He has been with the company since 1950.

Sherman E. Stecker has joined **Caloric Appliance Corp.** as safety director at the company's Topton plant. Before joining Caloric, he had been associated with Tung-Sol Electric, Inc., Washington, N. J.

Thomas B. Simon has been named manager of room air conditioning engineering for the Major Appliance Div., **Westinghouse.** Before joining Westinghouse, he was engineering manager at Crosley in Cincinnati.

J. Roy Barefoot has been appointed executive vice president of **McKay Machine Co.** He had been president of the Federal Machine and Welder Corp. Until his recent appointment, he had been a McKay vice president and operating head of the newly created Federal-Warco Div.

TO PAGE 54 →

POST

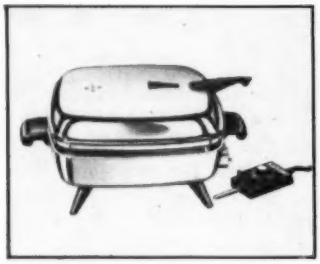
HANSEN

BROADHURST

BROWN

SIMON

BAREFOOT



To protect reputation for quality

Mirro selects Ampli-TUBE® Thermostat Control Plugs!

"As a means of preserving our long established reputation for quality products, Mirro has selected Ampli-TUBE control cord sets for our Mirro-Matic Electric Frypan and Mirro-Matic Buffet Server and French Fryer. Experience shows this sturdy control provides years of maintenance-free service . . . and the high level performance instrumental in maintaining and developing consumer loyalty for all Mirro products."

E. P. Demuth, Product Development Mgr. Mirro Aluminum Co.

Ampli-TUBE control plugs are engineered to meet exact customer specifications . . . from insulator to decal . . . economically . . . with QUALITY YOU CAN COUNT ON!

Complete individualized plug assemblies give undivided responsibility for reliable, safe operation . . . long-life calibration and dimensional stability . . . greater sensitivity, dependability!

For complete details on Ampli-TUBE Thermostat Control Plugs or KLIXON® Disc-Type Thermostats, contact your field engineer for prompt, personal attention or request catalog!

METALS & CONTROLS INC.
5907 N. MAIN STREET • VERSAILLES, KENTUCKY
A CORPORATE DIVISION OF
TEXAS INSTRUMENTS
INCORPORATED

Circle No. 334 on Reader Service Card.

Personals

→ FROM PAGE 53

Ross D. Siragusa, Jr. has been elected to the newly created position of vice president, sales for **Admiral Sales Corp.**, it has been announced by Carl E. Lantz, president of the marketing subsidiary.

Truman H. Cline has been appointed manager of engineering of **Stevens Mfg. Co., Inc.**, Mansfield, Ohio. He joined Stevens from The Newark-Ohio Co., where he served for 17 years, the last 12 as chief engineer of the electric range division.

CLINE

BARLETT

Stanford J. Barlett has been appointed manager of the Industrial Cleaning and Finishing Equipment Div., **The Alvey-Ferguson Co.** According to the company, he has had 15 years experience in design, manufacture and sale of industrial finishing equipment.

Walter Strand, former vice president and general manager, has been elected president of **Merkle-Korff Gear Co.**, Chicago. Also, **John Simms,** former assistant vice president, has been elected vice president.

SIMMS

STRAND

Armco Div., Armco Steel Corp., has announced six promotions in its sales organization. **George H. McClure,** assistant manager, Central Sales, becomes assistant manager, sales administration. **Dwight L. Hagedorn,** salesman, Dayton District, succeeds McClure as assistant manager, Central Sales.

Frank R. Ditmars, salesman, Cincinnati District, moves up to assistant manager, Western Sales; **Bert F. Carothers, Jr.,** salesman, Detroit District, advances to assistant manager, Eastern Sales; and **Edwin L. Singley,**

district manager, Philadelphia, becomes assistant manager, stainless steel products. **James B. Rafter,** assistant manager, Eastern Sales, will succeed Singley as district manager, Philadelphia. All of the new appointees will make their headquarters in Middletown with the exception of Rafter, who will move from Baltimore to Philadelphia.

Harry K. Johnson has been named treasurer of **The General Industries Co.,** Elyria, Ohio. He joined the company in 1927 as cashier.

W. Whitney Kuenn has been named sales manager of **The Stanhope Products Co.,** Brookville, Ohio. He will direct the sales of gaskets and fabricated insulation. Kuenn was previously associated with Lux Clock Mfg. Co. and the Owens-Corning Fiberglas Corp. in various sales capacities.

KUENN

HOOVER

Marvin R. Hoover has been appointed to the newly created post of manager of marketing for **Lancaster Glass Corp.** He will supervise the company's expanded sales, advertising, sales promotion, market research and product development activities.

Appointment of **Bruce A. Fleming,** vice president in charge of sales, **Edwin L. Wiegand Co.,** to executive vice president has been announced by E. N. Calhoun, president. Fleming joined the company in 1940 as assistant to the president.

F. H. Fischer and **W. D. Steele,** who recently formed their own organization, have been named eastern representatives for the **Roberts Brass Mfg. Co.,** Mitchell, Ind. They will sell Roberts' valves and fittings to original appliance equipment manufacturers.

Charles W. Ostrander has been appointed to the position of technical assistant to the president of **Allied Research Products, Inc.,** Baltimore. In his new capacity he will be responsible for investigating the sales and technical problems associated with a new line of metal finishing products being developed by Allied Research.

To Keller Manufacturing Co., Inc., it means a savings of nearly $50 a day in finishing costs on leaf rakes. And, theirs is a comparatively small plant operation.

Before moving into their new plant, this St. Louis manufacturer of Sweep-Easy lawn and garden tools investigated and tried out various finishing equipment. They chose Ransburg No. 2 Process to do the job because they found that only the Ransburg Electrostatic Hand Gun could give them the desirable increase in production—with improved quality—and at lower cost.

PRODUCTION IS NEARLY DOUBLED
QUALITY OF FINISH IS IMPROVED

With the Ransburg Hand Gun, Keller's daily painting prodution of leaf rakes nearly doubled what they were formerly getting with air hand spray. And, where they used to get only 168 rakes per gallon of paint, they now get 426 per gallon—over 2½ times as many—actually *an increase of over* 150% *in paint mileage.* With the unique "wrap-around" feature, electrostatic is improving the quality, providing a complete, uniform coating over all areas—even on the tine edges.

NO REASON WHY YOU CAN'T DO IT, TOO!

See how the Ransburg Electrostatic Hand Gun can save time . . . paint . . . and cut costs in YOUR finishing department. Or, if your production justifies, it'll pay you to investigate Ransburg's automatic electrostatic spray painting equipment. Write for our No. 2 Process brochure which shows numerous examples of modern production painting in both large and small plants.

RANSBURG

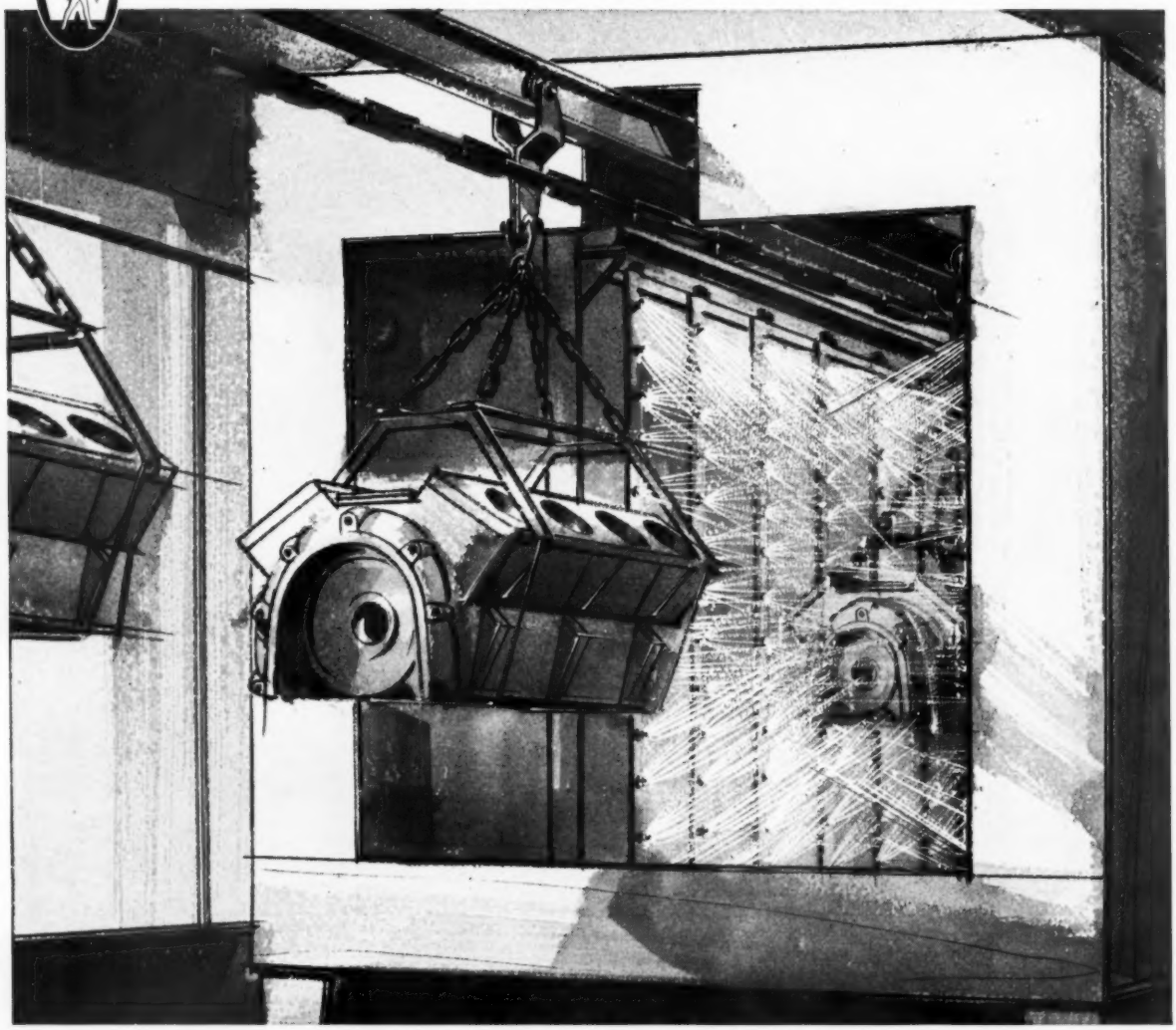
RANSBURG Electro-Coating Corp.

Box 23122, Indianapolis 23, Indiana

Affiliates in AUSTRALIA • AUSTRIA • BELGIUM • DENMARK • ENGLAND • FRANCE • FINLAND • GERMANY HOLLAND • ITALY • NORWAY • SPAIN • SWEDEN • BRAZIL • SOUTH AFRICA and NEW ZEALAND

Circle No. 343 on Reader Service Card.

CREATIVE RESEARCH • QUALITY PRODUCTS • PROFESSIONAL SERVICE



NORDALL–spray cleaner that locks out rust

Wyandotte NORDALL® is an emulsion cleaner that affords excellent protection against rust—keeps parts rust-free up to two months between manufacturing operations. Also ideal for spray cleaning aluminum, brass, and copper. NORDALL is nonevaporating—will not distill out of hot washers. It has a safe high flash point above 300° F. For full information on NORDALL, contact your nearest Wyandotte representative soon.

Wyandotte Chemicals
J. B. FORD DIVISION
WYANDOTTE, MICHIGAN • LOS NIETOS, CALIFORNIA • ATLANTA, GEORGIA

Circle No. 352 on Reader Service Card.

MPM

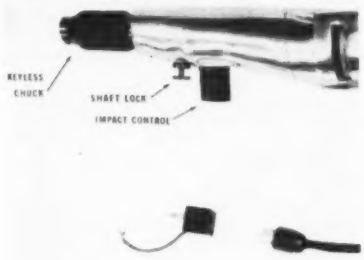
new supplies and equipment

Soak Cleaner For Aluminum

An alkaline soak cleaner which does not contain silicates, yet does not appreciably etch aluminum, has been developed by Enthone, Inc. Called Cleaner NS-35, it removes light soil, marking inks, and light buffing compounds.

Circle No. 201 on Reader Service Card.

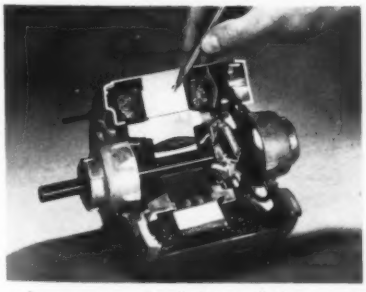
Rotary Impact Drill



A rotary impact drill, designated RP-A-1000 and manufactured by Roto-Pak, Inc., is said to drill 7/32 in. to 1-1/8 in.-diameter holes fast, and with little effort. The unit's high speed rotation, combined with high frequency impact, drills vitrified ceramics, tile, brick, etc., and, using high speed rotation only, will drill structural steel up to 1/2 in.-diameter at 3/8 in. or more per minute. Aluminum, brass, plastics, etc., can be drilled up to 1-1/8 in. in diameter at rates comparable with those of a heavy duty 1/2-in. electric drill.

Circle No. 202 on Reader Service Card.

Two-Speed Appliance Motor



A new stator insulation technique, said to be the first in the industry, is incorporated in a line of two-speed appliance motors recently introduced by General Electric's Appliance Motor Dept.

The integral insulation system, which consists of Alkanex powder bonded directly to the stator iron, replaces the paper or plastic slot insulators previously used. Irregularly shaped stator slots are readily insulated with the system. The insulation allows shorter and lighter weight motors, increased design versatility, reduced leakage current, better moisture resistance and longer insulation life at high temperatures.

Circle No. 203 on Reader Service Card.

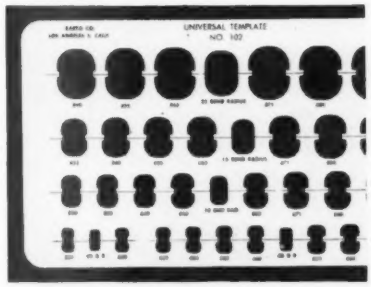
Brazing Alloy

Nicrobraz S Series, a mixture of powder in a high viscosity vehicle, is available from Wall Colmonoy Corp. The brazing alloys are applied by air-gun method for production work or by manual syringe for smaller jobs. Alloying time is said to be reduced 50 percent with the new alloy form.

All established Nicrobraz alloys are to be available in the new form and are applicable wherever the powdered materials have been used in the past. They are especially designed for use in applications involving high temperature service.

Circle No. 204 on Reader Service Card.

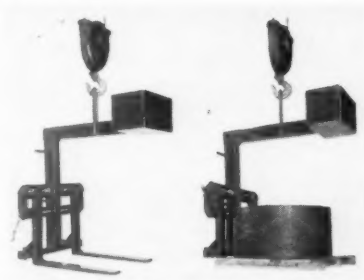
Universal Template



A Universal Template, No. 102, manufactured by Barto Co., is a device for drawing pictures of bent-up sheet metal parts of all gages from .020 through .090 in. in any of the four quadrants, and with bend radii from .03 to .25 in. Drawings of sheet metal parts are said to be made more quickly and more accurately with this template than was possible by earlier methods. In addition to its use in drawing formed sheet metal parts, the Universal Template can be used as a gage to indicate the thickness of flat sheet metal parts.

Circle No. 205 on Reader Service Card.

Pallet Lifter



C-F Pallet Lifters, adjustable or fixed-fork type, manufactured by Cullen-Friestedt Co., are designed to permit fast, safe overhead handling of palletized loads. The adjustable fork type (in photo) permits handling a wide range of pallet sizes; the forks may also be positioned at a precise point under a specific load. Damage to the load or pallet caused by cable or chain slings is eliminated. Both of the forged forks are moved simultaneously, inward or outward, by a heavy duty screw driven by a crank located on the right of the unit. The fork adjustment is quickly accomplished by one man.

Circle No. 206 on Reader Service Card.

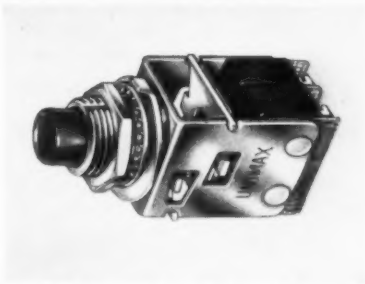
For further information on New Supplies and Equipment, use Reader Service Card on pages 63 & 64.

Metal Cutting Band Saw

W. F. Wells & Sons, Inc. has announced that their Model L-9 horizontal metal cutting band saw, previously offered only with variable speed drive, is now available as a standard model with a new four-speed drive.

Circle No. 207 on Reader Service Card.

Snap-Drive Pushbutton Switch

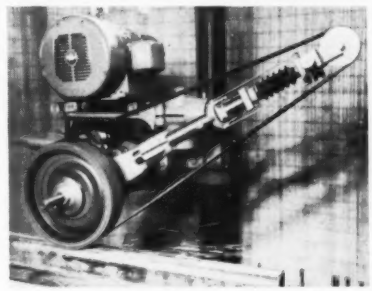


The pre-stressed, coiled spring toggle mechanism in the actuator of the Unimax snap-drive pushbutton switch, manufactured by Unimax Switch Div., Maxson Electronics Corp., is said to give fast positive operation regardless of the rate at which operating force is applied. The operator can tell by the *feel* of the button exactly when the switch operates, in either direction.

Overall dimensions of the switch are: 25/32 in. in length, 21/32 in. in width, 61/64 in. in depth behind panel, and 1-29/64 in. in height overall.

Circle No. 208 on Reader Service Card.

Abrasive Belt Arm Attachment



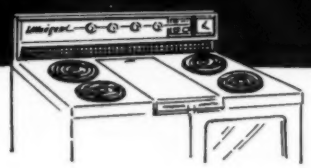
An abrasive belt arm attachment that can be easily installed on adjustable buffing lathes of various makes to provide an economical means of adding abrasive belt polishing operations to existing equipment, and to increase flexibility of production finishing operations, is now available from Acme Mfg. Co.

Circle No. 209 on Reader Service Card.

Neon Glow Indicator Assemblies

A series of "Econoglo" neon glow indicator assemblies, designed to fill the need for effective indicators to operate on stand-

What's Cookin'?



THE

Still-Man TOPP BURNER

TRADE MARK

STILL-MAN MANUFACTURING CORP. Still-Man NEW YORK 56, NEW YORK

MANUFACTURING CORPORATION
429 EAST 164TH STREET • NEW YORK 56, NEW YORK
The Last Word in Electric Heating Elements

STILL-MAN MANUFACTURING CORP.
429 East 164th Street, New York 56, N. Y.
Please keep us posted on what's cookin' with your new Still-Man TOPP BURNER Electric Surface Unit.

NAME_____ TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

15M-7-61

Circle No. 346 on Reader Service Card.

ard line voltage, has been introduced by Drake Mfg. Co. The assemblies are supplied in two styles; one with a Tinnerman nut, and the other with a snap-in plug. Both mount from front of panel, and both are available with or without built-in current limiting resistors. They come in a choice of three lens styles and in colorless, red, yellow or white.

Suggested applications are for portable appliances, office machines, radio, TV, etc.

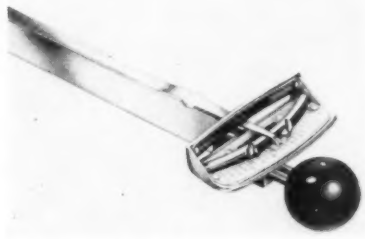
Circle No. 210 on Reader Service Card.

Compact Rotary Switch

A snap-in rotary canopy switch, designated No. 1474 and manufactured by Leviton Mfg. Co., Inc., is designed for use where there is no possibility of getting at the usual nut for tightening, and in other applications where limited space, rugged construction and ease in mounting are the prerequisites for switch selection. Used in small appliances and many forms of lighting designs, the No. 1474 snaps into a 1/2-in. keyed panel opening with a single push, there being no lock nuts to handle. The switch locks in place and is held permanently tight by a multi-fingered steel snap-in mounting clip.

Circle No. 211 on Reader Service Card.

Torque Wrench



A measuring instrument for making mechanical checks of stress, strain, thrust, tension and compression, where a record of the peak reading is desired, is the Torque Wrench with a memory pointer manufactured by the P. A. Sturtevant Co. A search began when company engineers found that standard reading or audible indicators were not adequate for tests in all situations. In a typical situation, a fastener manufacturer or inspection department makes periodical tests of the maximum torque a nut, bolt or screw will take before its elastic limit is reached. The Torque Wrench memory pointer remains at the peak torque exerted before the mechanical indicator returns to its normal position.

Circle No. 212 on Reader Service Card.

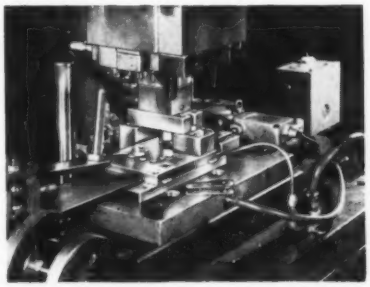
Permanent Split Capacitor Motor

Only 4-7/8 in. in diameter, this fractional horsepower electric motor is said to meet the requirements for a permanent split capacitor motor that produces more horsepower in a smaller package. Designed and manufactured by the Redmond Co., Inc., for a wide range of applications in the heating, refrigeration, air conditioning, ventilating and appliance industries, it is suited for any application requiring low cost, compact, lightweight, high quality quiet motors.

Designated Type CR, the motor combines higher starting torques with increased efficiency.

Circle No. 213 on Reader Service Card.

Tapping Unit



A tapping unit that can be built into progressive dies in any position has been developed by Laughter Corp. Designed to eliminate extra tapping operations in parts, maximum tap size is ⅜ in. with minimum center distance between tap holes of 2½ in. Actual production has proved 75 strokes per minute tapping four threads in the workpiece. Maximum tap stroke is ⅝ in., although stroke may be increased if die design requires.

The unit is hinged so that taps may be quickly changed in less than one minute. Mounting may be altered to suit most die requirements. Incorporated into the assembly is a compact unit with motor, solenoid valves and precision controls.

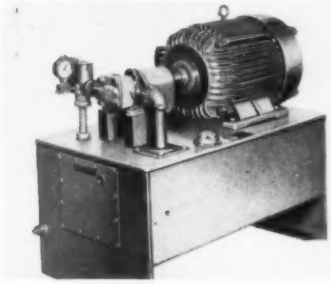
Circle No. 214 on Reader Service Card.

Manual Reset Thermostat

The Type WA-14 manual reset, non-adjustable limit control, manufactured by Therm-O-Disc, Inc., is so designed that, when an unsafe temperature is reached, the snap-acting bimetal disc operates to open the contacts. Only after the bimetal disc cools down and snaps back to its original position can the contacts be reclosed by depressing the reset button.

Circle No. 215 on Reader Service Card.

Hydraulic Power Units



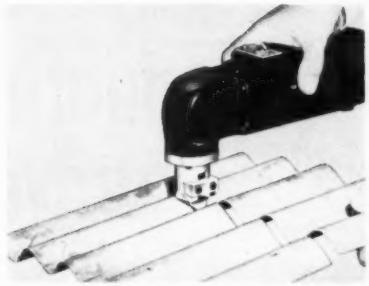
A new line of 1000 and 2000 psi single pump hydraulic power units with a working capacity conversion feature has been announced by Hannifin Co., a division of Parker-Hannifin Corp.

Thirteen models are offered with reservoir capacities from 15 to 60 gallons and pump capacities to 35 gpm. All standard units are equipped with a separate relief valve and incorporate an 1800 rpm motor. Single pump power units are for use in hydraulic applications requiring maximum service and minimum maintenance.

Circle No. 216 on Reader Service Card.

Air And Electric-Powered Nibblers

A line of air and electric-powered nibblers for practically any industry, and for any type of material, has been announced by Fenway Machine Co., Inc. The portable



nibblers operate on a unique punch and die principle. The special design and cutting action permits cutting of ferrous and nonferrous metals without distortion. This feature also applies to one of the newest nibblers which cuts corrugated steel through a simple adjustment of its cutting head. Each model cuts sharply and cleanly, the company states.

Circle No. 217 on Reader Service Card.

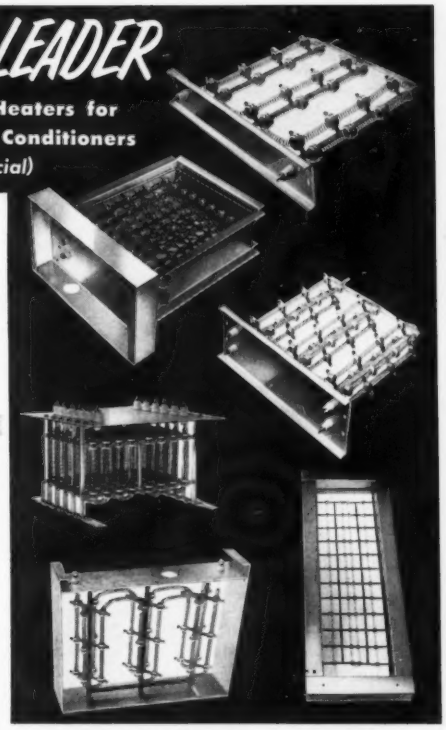
Turret Terminal Riveting Machine

The Model 900 turret terminal riveting machine manufactured by the Eyelet Tool Co. inserts and sets all makes of electronic terminals, base pins, etc. at speeds in excess of 2,000 per hour. It is suited to the electrical and electronic industries for setting electronic terminals in printed circuit boards and other electronic components.

Circle No. 218 on Reader Service Card.

How to be the LEADER

In Building Supplementary Heaters for Heat Pumps and Window Air Conditioners (Both Residential and Commercial)



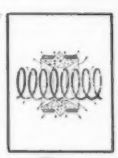
Always Be Years-Ahead in Design, Quality and Service

Rugged, efficient TEP Heating Units are used as supplementary heat source for heat pumps or as heat source for forced-air heating equipment. Designed to meet your own specifications, the coils may be used individually or in any combination desired.

Specify TEP "Open Coil" Heating Elements — FOR LONG SERVICE LIFE AND LOW MAINTENANCE—

- Floating frames that eliminate rigidly welded construction and permit elements "to breathe."
- Exclusive insulator and cross-bar design is an original research development, patented by TEP.

Cross-section of patented TEP insulator and cross-bar. More space for air circulation assures better heat dissipation, longer wire life. Patent No. 2921172



TEP Products

Call or Write for free TEP Engineering and Design Service.

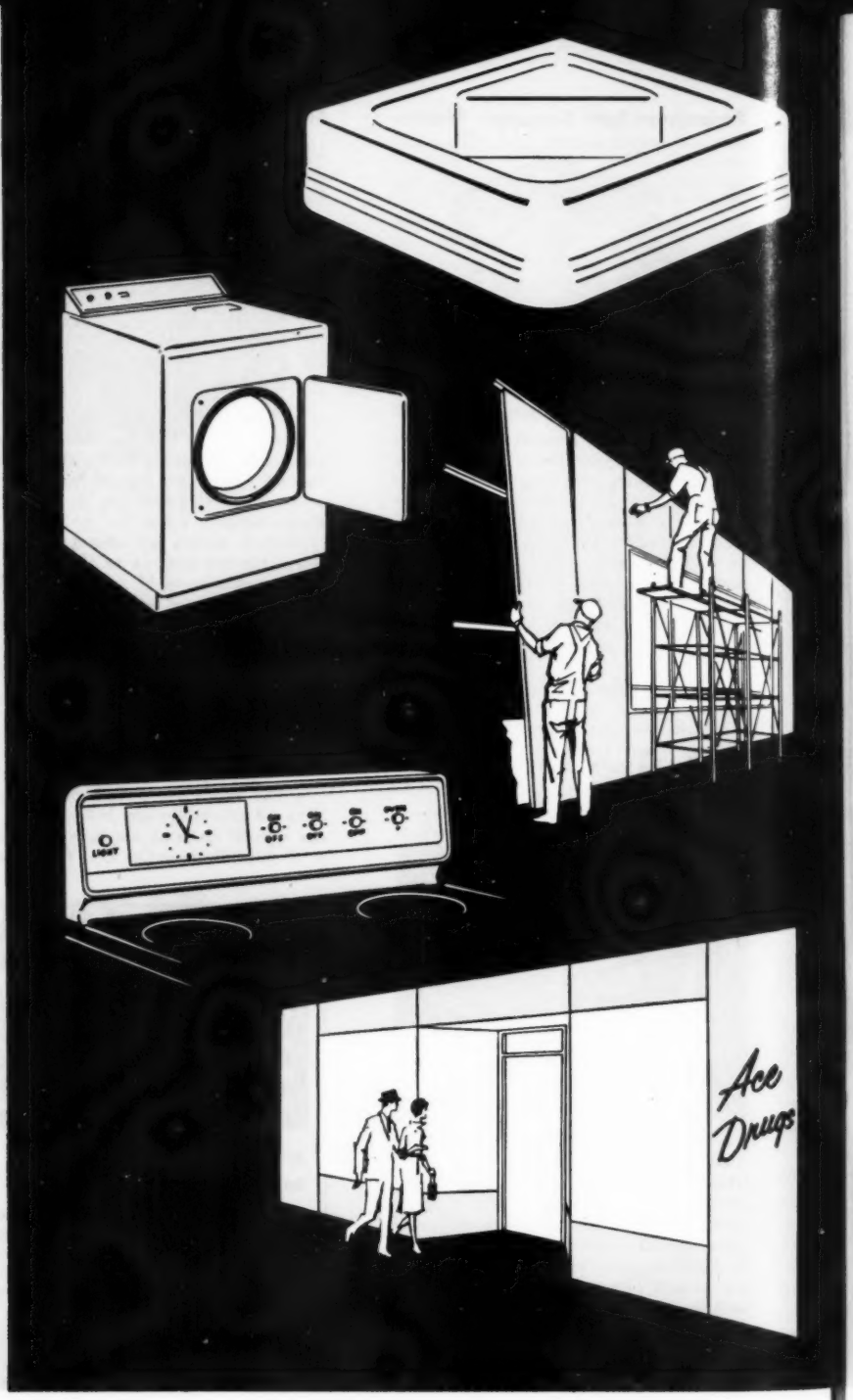
TUTTLE ELECTRIC PRODUCTS, Inc.
Kirkland 2, Illinois • Phone 2-3321

MANUFACTURERS OF OPEN COIL HEATING ELEMENTS, SWITCHES, CONTROLS

Circle No. 348 on Reader Service Card.

Production-proved COLORS for all frits, all applications

TITANIUM / DRY PROCESS
ZIRCONIUM / ANTIMONY
ALUMINUM / SCREENING PASTES



FERRO

FERRO CORPORATION

Color Division

Cleveland 5, Ohio . . . Nashville 11, Tenn.
Los Angeles 22, Calif.

Color Problems are Negligible when you use the *right* colorants with the *right* frits. You get *both* from Ferro, *production-proved* under day-to-day operating conditions.

World's largest manufacturer of inorganic colors, as it is of ceramic frit, Ferro has the resources and *know-how*—and competent field service staff—to solve almost any problem. Once solved, you can relax for Ferro's modern production facilities and close quality controls assure complete uniformity in the products you get.

Time is money, and Ferro's complete color service helps you get into production *fast.* You produce better ware, have fewer rejects. Just write or phone us! We'll take it from there.

Circle No. 353 on Reader Service Card.

MPM

new industrial literature

HANDBOOK OF SURFACE ROLLED PATTERNS

Complete information concerning sizes, pattern designs and identification numbers, actual and suggested product uses and methods of fabricating Sharonart, the surface-rolled patterns in stainless, carbon and coated steels, is contained in a new, 20-page handbook illustrated in color. Intended primarily for fabricators, designers and architects, the brochure depicts applications in the appliance, business equipment, automotive and architectural fields. Numbered patterns together with design and fabrication information are included as is information on finishing, tooling and fabrication. This unusually artistic handbook is by Sharon Steel Corp.

Circle No. 115 on Reader Service Card.

STEEL STRAPPING TOOLS

A bulletin published by Acme Steel Co. describes the firm's complete line of powered steel strapping tools and accessories. Illustrated with more than 35 application photos, the brochure offers pictorial examples of profitable use of the product by the shipping, packaging and materials handling industries. It features product data and specifications on such Acme Steel powered tools as steelstrappers, stretchers, sealers, tool mounts, strap feed assemblies and strapping accessories.

Circle No. 116 on Reader Service Card.

VIBRATION DAMPING

Literature describing a damping device said to be inexpensive and easy-to-apply, is available from Barry Controls Div., Barry Wright Corp. The new product, known as Strip-Damper, is said to minimize vibration response of such structures as electronic chassis, air ducts, and shock and vibration test fixtures. According to the company, tests have shown that attaching a Strip-Damper to a typical structure will reduce its vibration response by as much as 85 percent and extend resonant fatigue life from a few minutes to several hours.

Circle No. 117 on Reader Service Card.

THIS IS EASTERN STAINLESS

Eastern Stainless Steel Corp. has recently published a booklet describing the facilities, services and products of the company, which produces stainless steel sheets, plates, coil and strip exclusively. Titled "This is Eastern Stainless," the booklet is designed to be a ready reference for steel service centers, fabricators, and the many industries that require a knowledge of the properties of the many types of stainless steel made by Eastern.

Circle No. 118 on Reader Service Card.

METAL PROTECTION COATINGS

Two new coatings for metal protection are detailed in literature offered by Bee Chemical Co. The new products, Lacqua M-802 and Lacqua M-804, are said to equal the properties of quality lacquers and enamels without the fire hazards encountered with these materials. The Lacqua products are applied by dipping and, it is claimed, are easier to handle than lacquers, yet afford comparable protection for all plated and bare metals. The company reports the new coatings are already in production use for the corrosion protection of all types of metals.

Circle No. 119 on Reader Service Card.

SILICONE CATALOG

An eight-page, two-color catalog describing the complete line of General Electric silicones and their uses is now available. Designated CDS-129C, the catalog is liberally illustrated with photos and contains data pertaining to the various silicone products, including a complete selector guide for silicone rubber. The catalog is broken down into four general categories dealing with silicone fluids, silicone protective coatings, silicone electrical insulation and silicone rubber. A new feature of the catalog is the grouping of product types wherever possible under appropriate end-use headings.

Circle No. 120 on Reader Service Card.

NARROW AISLE HANDLING EQUIPMENT

A catalog published by The Raymond Corp. describes its complete line of narrow aisle electric trucks and hydraulic hand pallet trucks. The 16-page book is illustrated with on-the-job photos showing a wide variety of applications for space saving equipment. Separate pages illustrate the various models available and give pertinent information regarding specifications. The company's new triple telescopic mast is featured in a two-page center spread. Other pages describe the standard and heavy duty power units now offered in the line.

Circle No. 121 on Reader Service Card.

BARREL FINISHING UNITS

A brief new folder summarizing the complete line of Baird finishing units and replacement barrels is available from the Barrel Finishing Equipment Div., The Baird Machine Co.

Each of the seven basic units in the line are illustrated and described in brief "thumbnail" paragraphs. Six basic types of replacement barrels are handled in the same manner.

Circle No. 122 on Reader Service Card.

PLASTICS AND VULCANIZED FIBRE

Basic application information and engineering data on laminated plastics and vulcanized fibre is given by Taylor Fibre Co. in its 1961 condensed catalog. The data in the eight-page, two-color catalog is provided to aid engineers in selecting and applying these basic materials for electrical, electronic and mechanical components. The first two pages of text describe laminated plastics and vulcanized fibre in general terms, telling how they are made and where they can be used.

General data and engineering data for 21 of the most common grades of laminated plastics is provided. The general data give suggested applications, corresponding NEMA grades, military specification, color and forms and sizes in which furnished. The engineering data list typical physical, mechanical and electrical properties. A second section gives substantially the same type of information for six grades of vulcanized fibre. Special grades of vulcanized fibre are also described.

Circle No. 123 on Reader Service Card.

For further information on New Industrial Literature, use Reader Service Card on pages 63 & 64.

ZINC PHOSPHATING

A new four-page illustrated folder on Meta Bond, a production line system for creating zinc phosphate rustproofing on metal products prior to painting, has been released by International Rustproof Corp. The folder describes and illustrates the micro-crystalline nature of the Meta Bond protection, and compares degrees of protection afforded by this system in contrast to other commercial metal conversion coating systems.

Circle No. 124 on Reader Service Card.

ETCH RESIST FOR PRINTED CIRCUITS

Properties and advantages of Resist-Etch, which is said to positively block off unwanted electroplate and permit pattern lines .005 inches wide, .005 inches apart, are described in a four page technical booklet offered by The Meaker Co.

Circle No. 125 on Reader Service Card.

MAINTENANCE MATERIALS

Industrial maintenance materials are described and illustrated in a new catalog published by Ranco Industrial Products Corp. Covered are industrial floor and roof repair, machinery anchoring and grouting, and electric motor cleaning. Prices, coverages, drying time and general application procedures are included.

Circle No. 126 on Reader Service Card.

TOOL CATALOG

A 132-page catalog covering all categories of tools manufactured by Armstrong Bros. Tool Co. has recently been issued. Included are 330 items not previously listed. Covered are tool holders, setup and hold-down tools, tool bits, machine shop specialties, wrenches, socket wrenches, wrench sets and miscellaneous hand tools.

Circle No. 127 on Reader Service Card.

CHROME PLATING RINSE ADDITIVE

A new liquid that can be added to the rinses following chrome plating to prevent yellow chrome staining is fully described in Technical Data Sheet No. 123, a four-page usage and instruction sheet prepared by MacDermid, Inc. Called Metex Chrome Reducer M-663, the product eliminates or re-

duces hand cleaning, rinsing or wiping necessary to avoid staining. M-663 is especially applicable on chromium plated parts which become stained in final rinsing and drying because of the shape of the part or limitations of the rinsing operation. It contains no alkali salts or metal salts which leave undesirable residues behind. It is claimed the product is very stable in solution or in contact with air, making it economical to use even if only a small percentage of the work drags chrome into the rinse.

Circle No. 128 on Reader Service Card.

TINNERMAN SPEED NUT BROCHURE

A 24-page two-color brochure covering the complete line of fasteners for the appliance, electrical, electronic, automotive and office equipment fields is now available from Tinnerman Products, Inc. Specific examples of how some parts were eliminated, parts costs reduced, and assembly costs cut are shown in actual case histories in several large manufacturing plants.

Circle No. 129 on Reader Service Card.

NOTEBOOK ON HIGHWAY HARDWARE

The first U. S. Steel Technical Notebook on Highway Hardware is produced to help engineers find the quickest and best answers to some of their design problems as they relate to steel. The only "commercial" it carries is the USS label on the cover.

This first volume of the notebook deals exclusively with signs and sign supports. It has sections on specifications, sign supports, sign faces and typical current practice.

It includes information on proper gages and types of steel for the various "hardware" items. Surface finish and protective coatings, such as galvanizing, phosphate coating, painting and porcelain enameling are also covered.

Circle No. 130 on Reader Service Card.

FILL, WIPE AND POLISH UNIT

A new automatic fill, wipe and polish machine for finishing dials, control knobs, nameplates and clock faces is described in a new brochure available from Conforming Matrix Corp. Known as the Model FWP-40, this single machine applies paint and dial fillers, wipes and polishes at rates of up to 2500 parts per hour.

Circle No. 131 on Reader Service Card.

LAMINATED PLASTIC TOOLS

Two new technical bulletins have been prepared by Smooth-On Mfg. Co. to guide users of a new system for creating laminated plastic tools that are said to retain strength in continuous operation at high temperatures. The two high-temperature materials comprising the systems are covered in two separate bulletins. Sonite LM-23, an epoxy laminating resin, and Sonite SC-4, a surface coat epoxy used in combination with the laminating material, are covered.

Circle No. 132 on Reader Service Card.

WATER-SOLUBLE LUBRICANT

A four-page report released by Bemol, Inc. covers a newly developed No. 110 suspension, a water soluble molybdenum disulfide compound. Included in the description are product specifications, uses, relationship between die life and dilution rations, and application methods. Case history information is also presented.

Circle No. 133 on Reader Service Card.

CHROMATE CONVERSION COATINGS

Allied Research Products, Inc. has announced the release of new literature entitled "Technical Data Chart on Chromate Conversion Coatings." It presents a general discussion of the purpose for which these coatings are used. In addition, the inside two pages of the four-page folder feature a chart presentation of all the various Iridite coatings available. This chart indicates what metals they may be applied to, salient features, typical applications, applicable specifications, methods of application and salt spray resistance.

Circle No. 134 on Reader Service Card.

OVERLOAD PROTECTION

Bulletin GEA-7030, issued by General Electric, describes features and advantages of the company's Guardette for overload protection of appliance motors with up to 50 amperes locked rotor current. The publication contains selection and application information as well as a cross-section view of Guardette and a graph depicting overload protection under typical conditions.

Circle No. 135 on Reader Service Card.

NEW!
FROM
THERMAC

A Combination Automatic Control For Your Volume Furnace Line

Here is a new Thermac Gas Control designed and built specifically for furnace use. It's the Thermac SLS-400 EOP series for all popular furnaces and other appliances operating up through and including the 105,000 BTU range. Look at the outstanding features of this *completely assembled* unit:

- ★ **Silent, oil filled automatic operator.**
- ★ **Step-flow controlled ignition.**
- ★ **Independent pilot supply with 100% automatic safety.**
- ★ **25 V, 115 V and 220 V operation.**
- ★ **Straight through or bottom outlet to suit your requirements.**
- ★ **A.G.A. certified for natural, manufactured and LP Gas.**
- ★ **Safety, regulator and automatic main control valve combined in one unit.**

Certified by A.G.A.

THERMAC COMPANY

This new Thermac Control is completely field proven for every application within its rated capacity. It combines with the higher capacity SLS 420 and 520 Series Valves to enable you to standardize on Thermac for *all* your appliance gas controls.

Write for full details!

"28 years' experience building gas controls"

14296 EAST SIXTH STREET • CORONA, CALIFORNIA • REdwood 7-3511

Circle No. 347 on Reader Service Card.

Reader Service

COATED STRIP STEEL

A two-color brochure on the wide industrial application of coated strip steel manufactured by Sharon Steel Corp. has recently been made available. Presenting the "entire Sharon family of coated steels," including Galvanite, bright zinc, special alloy coat, electrogalvanized and painted and printed steel, the booklet is designed to help the user select the proper coated steel for his product.

Circle No. 101 on Reader Service Card.

STANDARD PUNCHES AND DIES

"More Holes per Dollar" is the title of the new 4-page illustrated bulletin describing the cost-cutting features of the complete line of punches and dies manufactured by The Cleveland Punch & Shear Works Co. for the steel fabricating industry.

Specifications for the company's complete line of standard punches and dies — 21 standard types in 400 sizes from 3/16 in. through 1-1/2 in. — are presented together with simplified ordering instructions. Also illustrated and detailed are eccentric and bevel-top dies, ripping punches and straight shank punches.

Circle No. 102 on Reader Service Card.

ELECTRONIC WELDING

A technical report on the metallurgy of electronic welding has been prepared by the technical staff of Hughes Aircraft Co., Vacuum Tube Products Div. The report includes significant factors in resistance welding, evaluation of weldability of various materials, weldability of clad materials, and dissimilar materials. The report is illustrated with photographs of magnified welds, and includes several charts and graphs.

Circle No. 103 on Reader Service Card.

GEARS AND RELATED PARTS

A four-page folder for catalog files, issued by Instru-Lec Corp., contains photos and engineering data on 28 types of gears and related parts. In addition, the folder outlines the company's consulting, engineering, design and manufacturing services along with experimental or quantity production facilities for components and complete assemblies.

Circle No. 104 on Reader Service Card.

STAINLESS MACHINING CHART

A stainless steel machining chart, providing a table of recommended machining rates for 37 different types of stainless steel, has been offered by Peter A. Frasse & Co., Inc. Ten separate machining operations, with specific tooling data, are condensed in one easy-to-use, quick reference chart.

Circle No. 105 on Reader Service Card.

ALUMINUM DEOXIDIZER

A new deoxidizer for aluminum which is free of chromic and nitric acid and presents no waste disposal problems is described in a technical data sheet prepared by MacDermid, Inc. Called Metex M-662, the product is a mixture of dry acid salts which

Use these postage-free cards to request:

- **SUPPLIERS' FREE LITERATURE**
- **INFORMATION ON ADVERTISED PRODUCTS**
- **MORE INFORMATION ON NEW PRODUCTS**
- **YOUR OWN SUBSCRIPTION TO MPM***
- **OR TO MAKE SUGGESTIONS ON THE EDITORIAL CONTENT OF MPM**

*MPM is distributed without charge to top management, sales management, purchasing, engineering, and key plant management and supervision in plants producing appliances and fabricated metal products.

FIRST CLASS
PERMIT NO. 142
St. Joseph, Mich.

BUSINESS REPLY CARD
No Postage Stamp Necessary if Mailed in U.S.A.

Postage will be paid by

Reader Service Dept.
METAL PRODUCTS MANUFACTURING
215 Wayne Street
St. Joseph, Michigan

THIS CARD NOT GOOD AFTER SEPTEMBER 1, 1961 7/61

Name _____ *Title* _____

Firm _____

Street _____ *City* _____

Zone _____ *State* _____ *Products Manufactured* _____

EDITORIAL ITEMS										ADVERTISEMENTS									
101	117	133	149	165	181	197	213	229	245	301	317	333	349	365	381	397	413	429	445
102	118	134	150	166	182	198	214	230	246	302	318	334	350	366	382	398	414	430	446
103	119	135	151	167	183	199	215	231	247	303	319	335	351	367	383	399	415	431	447
104	120	136	152	168	184	200	216	232	248	304	320	336	352	368	384	400	416	432	448
105	121	137	153	169	185	201	217	233	249	305	321	337	353	369	385	401	417	433	449
106	122	138	154	170	186	202	218	234	250	306	322	338	354	370	386	402	418	434	450
107	123	139	155	171	187	203	219	235	251	307	323	339	355	371	387	403	419	435	451
108	124	140	156	172	188	204	220	236	252	308	324	340	356	372	388	404	420	436	452
109	125	141	157	173	189	205	221	237	253	309	325	341	357	373	389	405	421	437	453
110	126	142	158	174	190	206	222	238	254	310	326	342	358	374	390	406	422	438	454
111	127	143	159	175	191	207	223	239	255	311	327	343	359	375	391	407	423	439	455
112	128	144	160	176	192	208	224	240	256	312	328	344	360	376	392	408	424	440	456
113	129	145	161	177	193	209	225	241	257	313	329	345	361	377	393	409	425	441	457
114	130	146	162	178	194	210	226	242	258	314	330	346	362	378	394	410	426	442	458
115	131	147	163	179	195	211	227	243	259	315	331	347	363	379	395	411	427	443	459
116	132	148	164	180	196	212	228	244	260	316	332	348	364	380	396	412	428	444	460

I would like to receive MPM magazine ☐

What article in this issue interested you most? _____

_____

Any other comment? _____

_____

are dissolved in water and used to prepare aluminum alloys for phosphatizing, welding, anodizing, painting, plating or bright dipping. According to the literature, the product makes an excellent base for final treatment on all aluminum alloys with the exception of those with high silicon content.

Circle No. 106 on Reader Service Card.

OFFHAND POLISHING

A 30-page booklet published by Behr-Manning Co. contains hints for improving offhand polishing operations. Covered are all phases, including fixturing, techniques, machines, belts, and contact wheels. Case histories are also presented.

Circle No. 107 on Reader Service Card.

INDICATOR LIGHTS

Drake Mfg. Co. has issued a new data sheet describing both heavy-duty and miniature indicator light units designed for applications where oil, water or dust penetration is a hazard. Styles of units available are illustrated, and full dimensional drawings are included, together with detailed information about the many features of unit design, lenses available, a listing of lamps suitable for use with the units, etc.

Circle No. 108 on Reader Service Card.

METAL FINISHING

Turco Products, Inc. has announced the release of a new, comprehensive metal finishing brochure titled "Specialized Chemical Processing Compounds for the Metalworking Industry." The illustrated booklet contains specific information for the use of each of the 43 products that make up the company's standard line of cleaning and processing compounds for the metalworking industry. Among the chemical processes discussed in the brochure are cleaning, phosphating, conversion coatings, protective coatings, paint and carbon removing, descaling, rust removing and prevention, inspection, processing aluminum and maintaining paint department and other plant areas.

Circle No. 109 on Reader Service Card.

HEAT RESISTANT TRANSFER MARKINGS

A new technical bulletin issued by The Meyercord Co. describes a line of heat resistant transfer markings and decal nameplates. The bulletin covers details of application and provides considerable data relating to performance under typical operating conditions.

Circle No. 110 on Reader Service Card.

TAPPING SCREW ANALYSIS CHART

A value analysis chart for tapping screws — designed as an aid for tapping screw evaluation in inspection and production departments — is available from Parker-Kalon, a division of General American Transportation Corp. Complete information is given in the two-color chart on the various features of tapping screws with respect to their performance on an assembly line. The 20 by 18-in. chart is suitable for mounting and features large printing for quick easy reference.

Circle No. 111 on Reader Service Card.

FASTENING AND STAPLING

A completely revised and expanded catalog of industrial stapling tools has been published by the Paslode Co., a division of Signode Steel Strapping Co. The 20-page booklet includes detailed descriptions of the "Clipper," a portable, air-powered, magazine-fed clip applicator for use in the assembly of spring units, Paslode's air powered staplers and stapling pliers, stapling hammers and tackers.

Circle No. 112 on Reader Service Card.

STORAGE SYSTEM PLANNING

A 16-page booklet on steel storage equipment is available from Penco Div., Alan Wood Steel Co. It is intended for use as a time-saving reference tool to help storage system planners quickly pinpoint main storage objectives and the best ways to achieve them. In addition, the booklet contains 63 illustrations showing the many kinds of steel storage equipment at the disposal of storage system planners.

Circle No. 113 on Reader Service Card.

JAR AND JAR MILL CATALOG

Abbe Engineering Co. has released its new Jar Mill and Jar Catalog 83 covering the 1961 line of eight jar mill styles for batch production processing, pilot plant production and analytical and experimental testing. The miniature ball or pebble mills are available for batch grinding, pulverizing, blending, and mixing, in capacities ranging from small fractional pint jar units to large 60-gallon multiple jar mills.

Circle No. 114 on Reader Service Card.

THIS CARD NOT GOOD AFTER SEPTEMBER 1, 1961 **7/61**

Name _____ *Title* _____

Firm _____

Street _____ *City* _____

Zone _____ *State* _____ *Products Manufactured* _____

EDITORIAL ITEMS									
101	117	133	149	165	181	197	213	229	245
102	118	134	150	166	182	198	214	230	246
103	119	135	151	167	183	199	215	231	247
104	120	136	152	168	184	200	216	232	248
105	121	137	153	169	185	201	217	233	249
106	122	138	154	170	186	202	218	234	250
107	123	139	155	171	187	203	219	235	251
108	124	140	156	172	188	204	220	236	252
109	125	141	157	173	189	205	221	237	253
110	126	142	158	174	190	206	222	238	254
111	127	143	159	175	191	207	223	239	255
112	128	144	160	176	192	208	224	240	256
113	129	145	161	177	193	209	225	241	257
114	130	146	162	178	194	210	226	242	258
115	131	147	163	179	195	211	227	243	259
116	132	148	164	180	196	212	228	244	260

ADVERTISEMENTS									
301	317	333	349	365	381	397	413	429	445
302	318	334	350	366	382	398	414	430	446
303	319	335	351	367	383	399	415	431	447
304	320	336	352	368	384	400	416	432	448
305	321	337	353	369	385	401	417	433	449
306	322	338	354	370	386	402	418	434	450
307	323	339	355	371	387	403	419	435	451
308	324	340	356	372	388	404	420	436	452
309	325	341	357	373	389	405	421	437	453
310	326	342	358	374	390	406	422	438	454
311	327	343	359	375	391	407	423	439	455
312	328	344	360	376	392	408	424	440	456
313	329	345	361	377	393	409	425	441	457
314	330	346	362	378	394	410	426	442	458
315	331	347	363	379	395	411	427	443	459
316	332	348	364	380	396	412	428	444	460

I would like to receive MPM magazine ☐

What article in this issue interested you most? _____

_____

Any other comment? _____

_____

FIRST CLASS
PERMIT NO. 142
St. Joseph, Mich.

BUSINESS REPLY CARD
No Postage Stamp Necessary if Mailed in U.S.A.

Postage will be paid by

Reader Service Dept.
METAL PRODUCTS MANUFACTURING
215 Wayne Street
St. Joseph, Michigan

Maytag Dedicates New Building

Formal dedication ceremonies of The Maytag Co.'s new headquarters building in Newton, Ia., took place recently. The new structure centralizes all of the firm's personnel having company-wide responsibilities, except for research, and quadruples the floor area of the building it replaces.

The building is unique in that two-thirds of it is new construction, the remaining third being the quarter-century-old office building incorporated into the new structure so that there is no visible difference in appearance. Special facilities include a 250-seat auditorium with stage and projection booth, several engineering testing laboratories, a library and a medical department.

Eureka Sales Up Eight Percent

An eight percent increase in sales for the first four months of 1961 over the same period for 1960 has been reported by Eureka Williams Co., vacuum cleaner manufacturer.

The figures include an 11 percent increase during April over April of 1960, and a 10 percent increase during March over the previous year's period.

Eureka also announced that it has established a factory branch for the Ft. Wayne-South Bend, Ind., area. Clifford D. Watson was named manager of the new branch, which is located at 1020 Drexel Ave., Ft. Wayne. He was most recently associated with Kelvinator in the same area.

Kelvinator May Sales Up

May sales of Kelvinator major appliances were up more than 20 percent over the same month last year, and were the highest unit total for any month since October, 1959, H. L. Travis, vice president, sales, announced.

Noting that May was the third month (January and April) of 1961 which was up over the corresponding month of last year, Travis said that current sales programs should continue the new sales momentum for the appliance division of American Motors Corp.

Virtually all major products contributed to the overall monthly increase with laundry equipment and refrigerators the important leaders. The May total was also nearly nine percent above April of this year.

Rayescent Facilities Expanded

Westinghouse has announced that its production facilities for Rayescent electroluminescent panels have been substantially expanded.

The new facilities will permit the company to produce Rayescent panels in metal, as well as in glass or plastic. The metal panels can be produced in sizes up to 2 ft square.

Value of Vending Machine Shipments Up 28.5 Percent

Manufacturers' shipments of vending machines in 1960 increased 28.5 percent in value over 1959. The total value of shipments in 1960 was $164,500,000, compared to $126,900,000 in 1959, according to a statistical study underwritten by the National Automatic Merchandising Association.

Prepared annually by the Bureau of the Census at the request of NAMA, the study shows the 1960 total to be 50 percent above 1958 shipments of $109,400,000.

The most significant rise was registered by beverage vending machines, with total shipments worth $109,400,000 in 1960, which exceeds the 1959 figure by 45 percent. In that category, shipments of post-mix soft drink vending machines increased from 4437 machines in 1959 to 13,285 in 1960, a 300 percent advance.

Navy Contract to Comptometer

Comptometer Corp., Chicago, has been awarded an additional half million dollar contract for the production of data recorder reproducers by the U. S. Navy, bringing the total contracts for this item to an amount in excess of $1 million. Production of the equipment will be carried out by Comptometer's Communications and Electronics Div.

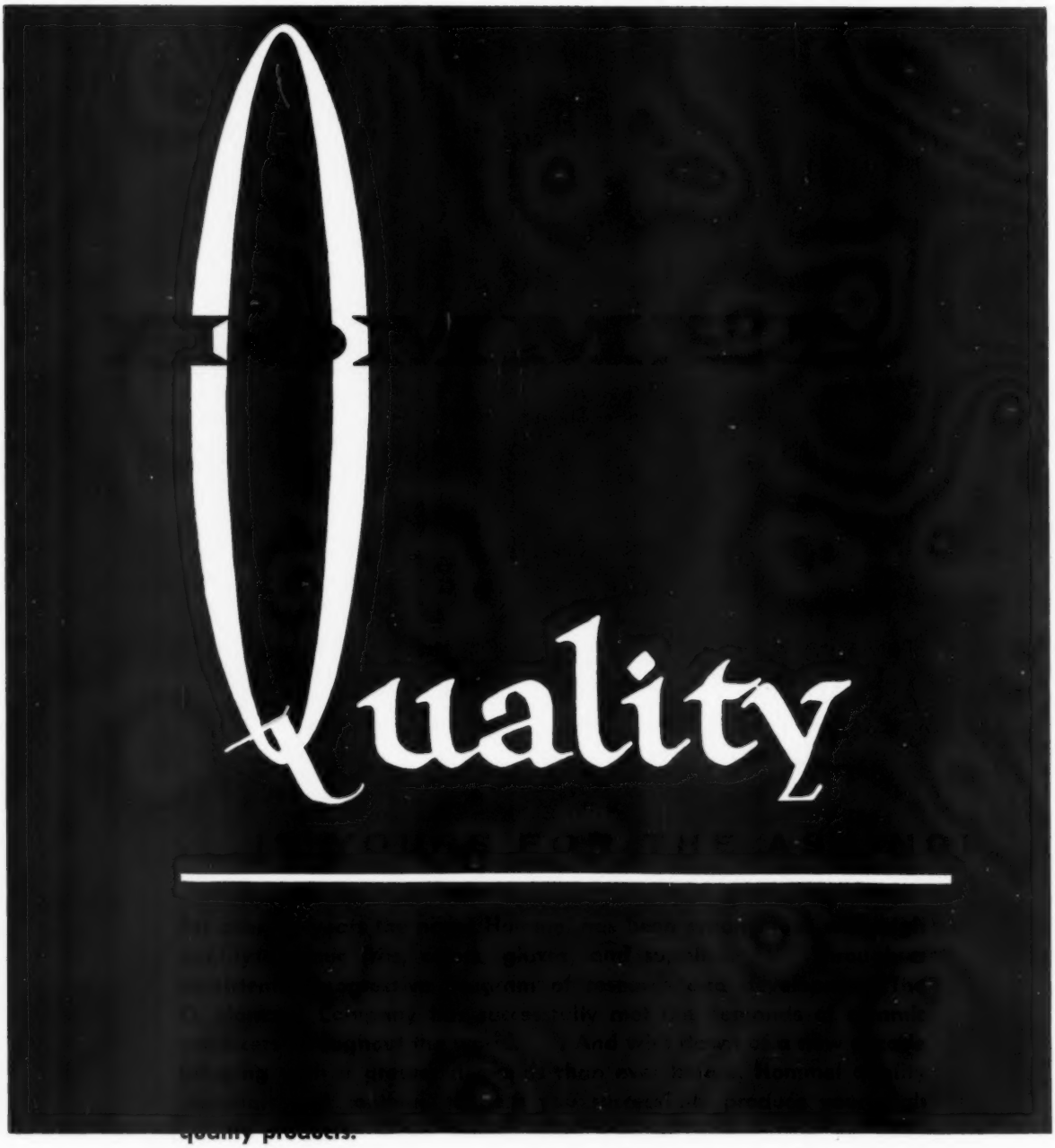
Hotpoint Introduces "Operation Showroom"

The top brass of Hotpoint Div., General Electric Co., were very much in evidence at a press preview for what the company calls the "world's largest kitchen planning and display center," just opened in the Commonwealth Edison Building at 68 West Adams St., Chicago. Termed "Operation Showroom," and costing a reported $100,000, the new 5,300-sq ft air-conditioned kitchen planning center represents the third installation in "a new concept to open public display centers in key metropolitan cities as an extension of Hotpoint dealer stores to demonstrate and display the kitchen-laundry appliances" the company manufactures. No prices are to be quoted or sales made at the planning centers.

Included in the center are three complete kitchens, one an apartment type, the second a "free-standing" kitchen, and the third a "built-in" kitchen. In addition to these installations, each color, model and size of Hotpoint's complete line of appliances is on display. In the Chicago installation this includes new automatic washers and dryer models just ready for introduction for the first time to sales outlets.

According to John F. McDaniel, gen-

One of the complete kitchens installed in the new Hotpoint Kitchen Planning and Display Center.



quality products.

Yes, Hommel's wide experience in the development and production of high quality ceramic raw materials is Yours for the Asking! . . . Talk to your Hommel representative . . . Or contact us direct. Hommel is Ceramics.

THE O. HOMMEL CO.

PITTSBURGH 30, PA. DEPT. MPM – 761

HOMMEL

West Coast – 4747 E. 49th Street, Los Angeles, California

Circle No. 323 on Reader Service Card.

eral sales manager, the new marketing concept for the appliance industry began three years ago when Hotpoint first opened a center in Pittsburgh. Last year a larger center was opened in New York. The new Chicago center is the largest to date.

"Few dealers can carry every model refrigerator we make," says McDaniel. "For example, Hotpoint makes ten refrigerators in five colors; that is 50 models." He pointed out that a multiple-brand dealer would need a warehouse and not a store in order to display all models.

At market time the new display center will replace the earlier display in the Merchandise Mart as a dealer reception center. At all other times during the year, Hotpoint expects that an average of 200 people per day will see the company's products. For potential purchasers there will be free kitchen planning help and, if the housewife is not sure how to roast, bake, or broil, there is a complete working kitchen with demonstrators to point the way. This also applies to advice on washing clothes and heating or cooling the home.

McDaniel feels that the new display centers will be a great help to dealers, since they carry more appliances and are better equipped to demonstrate these appliances to potential purchasers, who will then be referred to Hotpoint dealers.

Admiral Signs Marketing Pact

Metropolitan Telecommunications Corp., Plainview, N. Y., a producer of wire communication equipment, has signed a 10-year exclusive sales license with Admiral Corp., permitting Admiral to market 3 million of Metropolitan systems.

Under the contract, Admiral will market a minimum of $300,000 annually, principally status systems for hotels and motels — an automated method of checking out guests, relaying messages and reducing housekeeping costs through improved efficiency.

Westinghouse Air Conditioners Up 12 Per cent in Quarter

First quarter sales at the Westinghouse air conditioner division exceeded last year's results by 12 percent, according to Raymond K. Serfass, division manager. Total dollar sales also represented a record high for any first quarter during the seven-year history of the division.

"The number of individual packaged products sold by the division during the first three months of 1961 rose by 45

TO PAGE 70 →

METAL PRODUCTS STATISTICS

		1961 (Units)	1960 (Units)	% Change
Gas Furnaces	April	63,200	67,500	- 6.4
	Jan.-Apr.	244,100	248,200	- 1.7
Gas Boilers	April	8,926	9,862	- 9.5
	Jan.-Apr.	34,604	34,469	+ 0.4
Gas Conversion Burners	April	5,500	7,200	-23.6
	Jan.-Apr.	22,300	30,900	-27.8
Oil-Fired Central Heating Equipment	March	33,271	38,370	-13.3
	Jan.-Mar.	106,315	114,677	- 7.3
Gas Ranges, Free-Standing	April	108,000	128,500	-16.0
	Jan.-Apr.	426,600	519,800	-17.9
Gas Ranges, Built-In	April	28,300	28,000	+ 1.1
	Jan.-Apr.	100,100	104,200	- 3.9
Gas Water Heaters	April	268,300	216,200	+24.1
	Jan.-Apr.	963,000	893,800	+ 7.7
Gas Vented Recessed Wall Heaters	April	24,500	29,900	-18.1
	Jan.-Apr.	101,600	108,600	- 6.4
Gas Floor Furnaces	April	3,600	7,500	-52.0
	Jan.-Apr.	17,600	21,500	-18.1
Gas Direct Heating Equipment	April	51,900	61,300	-15.3
	Jan.-Apr.	210,500	219,800	- 4.2
Gas Unit Heaters & Duct Furnaces	April	9,900	11,800	-16.1
	Jan.-Apr.	48,500	52,900	- 8.3
Gas Incinerators	April	2,900	3,900	-25.6
	Jan.-Apr.	14,000	15,700	-10.8
Electric Household Refrigerators	April	273,900	300,000	- 8.7
	Jan.-Apr.	1,038,600	1,225,600	-15.2
Electric Farm & Home Freezers	April	81,200	102,100	-20.9
	Jan.-Apr.	288,100	355,500	-19.0
Electric Ranges, Free-Standing	April	69,700	69,600	+ 0.1
	Jan.-Apr.	297,100	312,400	- 5.2
Electric Ranges, Built-In	April	58,700	58,300	+ 0.7
	Jan.-Apr.	217,000	233,700	- 7.0
Electric Water Heaters	April	62,500	57,000	+ 9.7
	Jan.-Apr.	247,100	254,200	- 2.8
Electric Dishwashers	April	52,100	50,300	+ 3.6
	Jan.-Apr.	193,700	187,500	+ 3.3
Electric Food Waste Disposers	April	64,800	64,100	+ 1.1
	Jan.-Apr.	243,800	251,800	- 3.2
Dehumidifiers	April	37,100	36,400	+ 1.9
	Jan.-Apr.	152,200	147,100	+ 3.5
Combination Washer-Dryers	April	8,751	10,404	-16.0
	Jan.-Apr.	32,076	59,433	-46.0
Washers—Automatic & Semi.	April	164,481	175,983	- 7.0
	Jan.-Apr.	773,330	843,899	- 8.0
Washers—Wringer & All Other	April	45,214	59,845	-24.0
	Jan.-Apr.	198,436	235,769	-16.0
Electric Dryers	April	31,093	35,659	-13.0
	Jan.-Apr.	206,627	240,680	-14.0
Gas Dryers	April	14,949	17,554	-15.0
	Jan.-Apr.	106,006	122,708	-14.0
Metal Furniture	March	*	*	-24.0
	Jan.-Mar.	*	*	-20.0
Vacuum Cleaners	April	265,032	278,391	- 4.8
	Jan.-Apr.	1,115,449	1,171,122	- 4.8
†Television	Feb.	444,418	503,453	-11.7
	Jan.-Feb.	812,353	1,029,947	-21.8
†Radio (1)	Feb.	1,115,029	1,142,368	- 2.4
	Jan.-Feb.	2,205,102	2,798,156	-21.2
Typewriters	April	88,941	*	*
	Jan.-Apr.	335,122	*	*
Room Air Conditioners	April	195,700	226,900	-13.7
	Jan.-Apr.	724,300	668,400	+ 8.4
Steel Barrels & Drums	March	2,714,274	2,450,608	+10.7
	Jan.-Mar.	7,395,457	7,207,380	+ 2.6
Steel Pails	March	7,173,761	5,718,085	+25.7
	Jan.-Mar.	17,207,737	17,463,228	- 1.5

(1) Including auto receivers
* Not reported † Output — all other figures are factory shipments or factory sales

Sources for this information: Gas Appliance Manufacturers Association, National Electrical Manufacturers Association, American Home Laundry Manufacturers Association, Vacuum Cleaner Manufacturers Association, National Association of Furniture Manufacturers, Electronic Industries Association, Air-Conditioning and Refrigeration Institute, and U.S. Dept. of Commerce.

From years of intensive research comes a

ONE-COAT

ACRYLIC FINISH FOR APPLIANCE MANUFACTURERS

Cook's new Armorcote Acrylic Enamel is a finish that "comes alive" with a rich depth of film appearance. In addition, Armorcote offers you the economies of **one-coat** application. Requiring no primer, it can reduce labor costs and inventory expenses. Ideal for phosphated steel or alodized aluminum, it has fast set-up time, high resistance to overbake discoloration, and may readily be repaired in plant or field. To give you full information, including technical data, a Cook representative will be glad to call.

ARMORCOTE ACRYLIC ENAMEL
Resists Chipping
Cook's Armorcote has excellent resistance to chipping, abrasion, and impact.
Resists Acids
Spilled foods—such as acids from citrus fruits and sour milk—will not damage Armorcote's bright finish.
Resists Alkalies
After lengthy immersion in a 5% solution of caustic soda, Armorcote remained unaffected.
Resists Heat, Cold
Thorough testing shows Cook's Armorcote exceptionally resistant to varying degrees of heat and cold.
Resists Detergents
Because of its Acrylic formulation, Armorcote offers much greater resistance to detergent solutions than other non-acrylic type coating materials used extensively throughout the appliance industry.
Resists Kitchen Grease
Armorcote withstands greasy kitchen fumes, even direct grease contact, with no softening, no loss of color.
COOK'S PAINTS

COOK PAINT & VARNISH COMPANY, Kansas City, Missouri

Factories:
Kansas City
Detroit
Houston

Circle No. 312 on Reader Service Card.

MANUFACTURERS KNOW

omni-glow

PILOT LIGHTS

The most versatile, long-life pilot light available...

add light to the life of your product!

LONG LIFE—usually outlasts the equipment on which it is used. Vibration proof, shock proof—gives thousands of peak operating hours. STYLING—every requirement covered with wide variety of lens colors and shapes, lens imprints, ring finishes, etc.; adds beauty to any product. SIMPLIFIES PRODUCTION—only ½-inch hole needed—mounts with push-on speed nut or snap-fits into your panel... and SERVICE—units made to **your** requirements, delivered to meet **your** production schedules... quantities from 1 to 1,000,000.

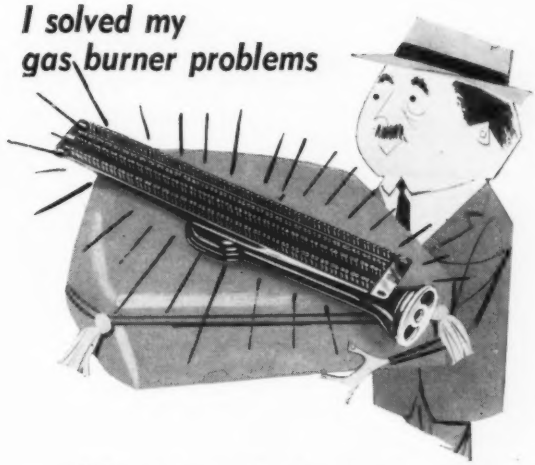
FREE: OMNI-GLOW catalog, with detailed information and specifications, and a sample OMNI-GLOW. Write to us directly, or use the reader service card.

IDI Industrial Devices, Inc.

EDGEWATER 13, NEW JERSEY

Circle No. 324 on Reader Service Card.

I solved my gas burner problems



– with patented stamped steel porcelain enameled burners

- No drilling or tapping necessary
- Porcelain enamel finish
- Smooth, non-resistant interior
- Light weight
- Ready to install
- Raised 5/8 inch ports
- Ideal for commercial, industrial, and domestic heating appliances, water heaters and laundry dryers.

For Information Write or Phone

SAMUEL STAMPING & ENAMELING CO.

Burner Division — Chattanooga, Tennessee

Circle No. 345 on Reader Service Card.

To sell to manufacturers of

VENDING MACHINES

Measure the Market!

Pinpoint the Prospects!

Make sure of Impact!

Now! AIRLESS SPRAY ECONOMIES FOR FINE FINISHING WORK WITH

GRACO "FF"

FINE FINISHING TIPS

Total atomization of paint is accomplished inside the Graco "FF" Fine Finish Tip creating the exclusive diamond-like "FF" pattern. This excellent lapping pattern makes it possible to apply an even mil thickness suitable for precise final finishes.

With the Graco "FF" Fine Finish Tip, you can have *airless spray economies* for fine finishing work.

Comes in a wide range of tip sizes to handle almost any viscosity.

GRACO ENGINEERS & MANUFACTURERS / **GRAY COMPANY, INC.**
726 Graco Square
Minneapolis 13, Minnesota

See Phone Book Yellow Pages "Spraying" for Graco Suppliers

Circle No. 320 on Reader Service Card.

THE IDEAL PRODUCTION-LINE FASTENER

"POP" Rivets cut your fastening costs on the production line, because they're set from one side by one operator, using light-weight tools that are taken to the work. Rivets can be pre-positioned; setting is unusually fast and easy, with no danger of marring work surfaces, burring rivet heads, or stripping rivets from the work. Fastening quality and grip strength are uniformly high . . . and do not vary with the strength or skill of the operator. Setting tools are moderate in cost . . . and are available in manual, hydraulic and pneumatic types.

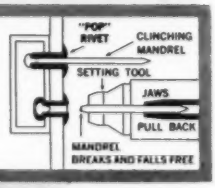
Remember, we've given you just one of the one dozen reasons why "POP" Rivets run rings around the rest. If you're interested in improving the quality, appearance and sales appeal of your products . . . and reducing fastening costs at the same time . . . be sure to investigate all the reasons that make "POP" Rivets the first choice for modern fastening.

Genuine "POP" Rivets are available through a large network of distributors throughout the country. Write today for complete information . . . and for the name of your local "POP" Rivet Distributor.

UNITED "POP" RIVETS

HERE'S HOW THEY WORK

"POP" Rivets are inserted and set from the same side: (1) Rivet is inserted in the work. (2) Jaws of the easy-to-use setting tool grasp the mandrel. (3) Tool is operated. Jaws pull back. Rivet is set. Mandrel breaks and falls free.



FASTENER DIVISION • UNITED SHOE MACHINERY CORPORATION
1838 River Road, Shelton, Connecticut, U.S.A.

Circle No. 350 on Reader Service Card.

Industry news

→ FROM PAGE 67

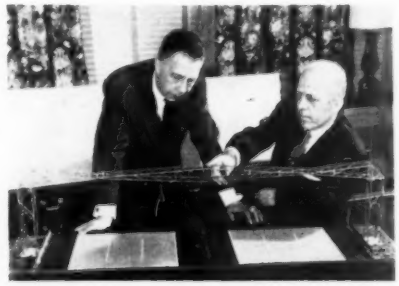
percent," Serfass said, "reflecting in part the introduction last year of our new WhispAir heat pump — the first such unit designed to attach directly to an outside wall of the home."

Radio Company Formed

The formation of Multiplex Corp. to develop and produce radios capable of receiving multiplex or stereo broadcasting on a single FM band, has been announced by Automatic Radio Mfg. Co., Boston. David Housman, president of Automatic Radio, said the new corporation, a wholly owned subsidiary, will be headed by John J. Grady. The corporation headquarters will be at 122 Brookline Ave., Boston.

U. S. Steel Unveils New "Highway Hardware" Program

U. S. Steel officials recently disclosed technical details of the company's new "Highway Hardware" program at a press conference in Chicago. Wilbur S.



A new design for a sign support spanning the wider modern highways is this tapered box truss hung between two trussed cantilever columns — one of the many design concepts in U. S. Steel's new Highway Hardware program. Discussing construction details of the model are Robert C. Myers, (left), U. S. Steel's director of market development; and Robert S. Holmes, manager of highway construction marketing.

Smith was retained as design consultant and, following an extensive research program, USS has developed engineering data and new design concepts which are being incorporated in two Highway Hardware Notebooks. (*See new literature page 62.*) Covered are signs, sign supports, guard and bridge rails, light standards and right-of-way fence.

With millions of dollars being funnelled into the continuation and completion of America's vitally needed network of interstate and defense highways, USS has worked on the premise that the effective and safe use of these highways can be no better than its signs and other allied structures .

TO PAGE 73 →

COMING FEATURES

★ 15TH ANNUAL HOME LAUNDRY SECTION — SEPTEMBER ★

STANDARDIZATION — SIXTH IN A SERIES

METAL DESKS UPGRADED WITH NEW TAPING TECHNIQUE

ELECTRIC FURNACE MEETS SPECIAL NEEDS OF MOBILE HOMES

WHAT ABOUT DOUBLE INSULATION FOR APPLIANCES?

NEW SHEARING LINE BOOSTS EFFICIENCY AT GP&F

A VERSATILE WELDING UNIT FOR "CUSTOM-MADE" KITCHEN CABINETS

STRAIN GAUGES FOR EVALUATING STRESSES IN PORCELAIN ENAMELED PRODUCTS

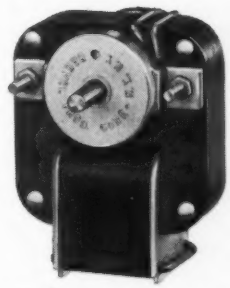
A 68-INCH STRIP COATING LINE

HOW SMALL PRESS BRAKES PAY BIG DIVIDENDS

HANDLING FIBER GLASS AT FOWLER

A WEAR-ABRASION TEST FOR PORCELAIN ENAMEL

BREVEL



Shaded pole motor—use alone or as backbone for geared motor.

every day Brevel meets unusual specifications for small motor applications

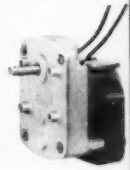
Your new appliances get into production—and to market—faster, at lower cost when BREVEL supplies your motors. Chances are we have a suitable design!

You can rely on BREVEL's experienced specialization to design, engineer, and volume-produce precision motors that give consistently superior service at low cost.

Our representatives cover every part of North America from local offices. Write, wire, phone NOW . . . and find out.

Series S Open Spur Gear Motors

Series W Open Worm Gear Motor



NEW Series FB enclosed Helical gear motor. High performance — low noise. Available with brake or clutch.

BREVEL

BREVEL PRODUCTS CORPORATION, 609 West 26th Street, New York 1 • WAtkins 4-4737
manufacturers of small motors for the appliance industry

CHICAGO: Jerry Golten Co. • 2750 W. North Ave. • EVerglade 4-5959

LOS ANGELES: Electric Motor Engineering Inc. • 6515 Sunset Blvd. • HOllywood 9-7393

TORONTO: Brevel Products, Ltd. • 45 Crockford Blvd. • Scarborough, Ont. • PLymouth 7-5140

Circle No. 307 on Reader Service Card.

Praised by Practiced Homemakers . . .

LUX

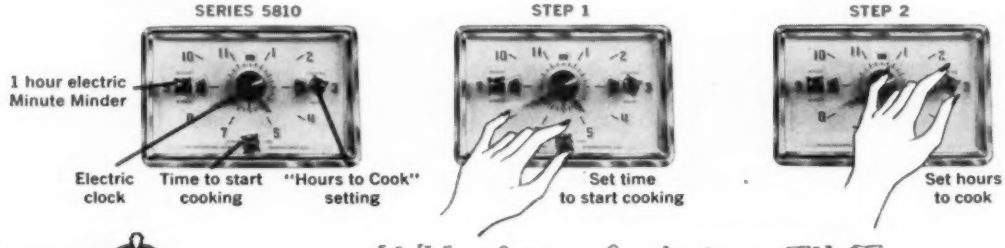
the finest in timer fashion and function

Today's hurry-up housewife—with her day devoted to various duties—looks for appliances that operate simply, function faithfully, demand little attention.

That's why the Lux timer—for ranges, dryers, washers—is praised by practiced homemakers.

These ladies know that the range with the Lux timer lets them out of endless supervisory minutes . . . that given simply the right start, Lux looks after what's cookin' until it's properly finished.

In today's keenly competitive appliance sales market, a product's reliability, fashion, and simplicity of operation are the keys to continuing customer satisfaction. The Lux timer's engineered construction and imaginative styling satisfy on all counts. Demonstrate the Lux timer today . . . nothing could be simpler.



LUX Time
YOUR TIME-REMINDER LINE

LUX . . . first . . . for lasting TIME

DEPARTMENT MPM

THE LUX CLOCK MANUFACTURING COMPANY, INC.

95 JOHNSON STREET • WATERBURY, CONNECTICUT

Circle No. 330 on Reader Service Card.

Industry news

→ FROM PAGE 70

Robert C. Myers, director of market development for the corporation, cited three reasons for creating "a highway hardware" program: "First, we saw a natural and growing outlet for a host of steel products — providing we could make the right kind of technical information available to the right people.

"Second, we learned from design engineers of a real need to provide data giving them greater selectivity of materials to help meet their primary goals of creating more efficient and safer road systems. This is particularly true of new concepts for the hardware that goes on top of the road — items that determine efficiency of traffic flow and general safety.

"Finally, we saw that a broad marketing program could prove helpful to metal fabricators, including the smaller businesses. By making our data available to them — data which some could not afford to research themselves — hopefully they will have better opportunities to participate in highway contracts they might otherwise miss."

1961 Home Laundry Sales Expected to Equal 1960

The home laundry appliance manufacturing industry expects 1961 factory sales to equal or slightly surpass 1960 sales, according to an announcement by Guenther Baumgart, president of the American Home Laundry Manufacturers' Association.

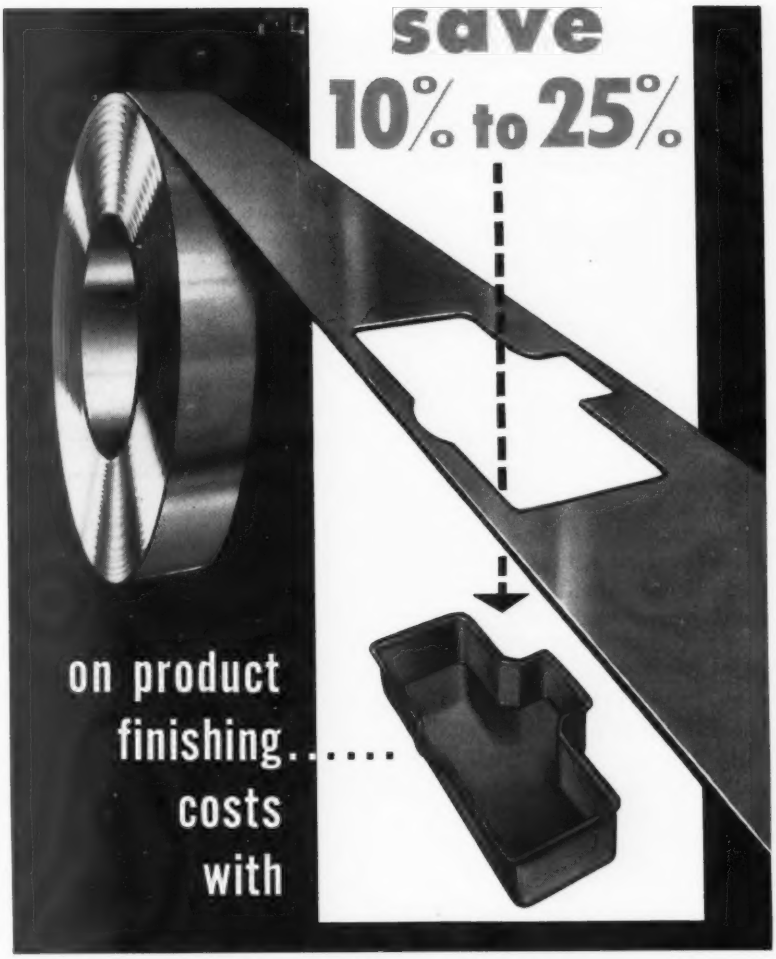
Baumgart based his statement on an average of independent forecasts made by industry market research heads at the end of the first quarter. "This indicates that most industry manufacturers now feel the bottom of the 1960-61 decline has been reached and sales in the final three quarters of 1961 will be better than a year ago — enough so to offset the 1961 first quarter sales decline from 1960," he said.

ARI Forms New Section

A Non-Residential Warm Air Heater Section has been organized within the Air-Conditioning and Refrigeration Institute. Six member companies joined at the organizational meeting.

A number of other companies not now members of ARI are considering joining the new section, and a number of present member companies manufacturing products within the scope of the new section are expected to join, ARI officials said.

N. H. Stern, marketing manager, industrial, Lennox Industries, Inc., was



Pre Finished Metals

Better finish . . . at lower cost!
Cut metal product finishing costs as much as 10% to 25% by using steel or aluminum coils or sheets *already pre-coated* by Pre Finish Metals, Inc., specialists in applying custom-formulated finishes! Precoating also assures a more uniform, better quality, more durable finish for either functional or decorative use.

Stamp, draw, shape, bend, or form it!
Pre-coated metal actually aids fabricating operations in your plant! The finish acts as a lubricant for better flow of material—and longer die life. You also save on production costs, reduce space requirements, and add product sales appeal.

To meet your specifications!
Coatings are custom formulated and pre-tested to meet product fabricating and use requirements! Unlimited color variations, patterns, wood grains, and embossed designs are supplied in finishes ranging from organic coatings (organosols, plastisols, expoxies, acrylics, alkyds) to polyvinyl film laminates. *Supply your own metal or we will furnish.*

For the cost-cutting facts, call or write . . .

ARTISTRY IN METALS

PRE FINISH METALS
INCORPORATED
2111 E. Pratt Blvd., Elk Grove Village, Ill.
Phone: HEmpstead 9-2210

Circle No. 340 on Reader Service Card.

elected chairman of the new section, whose recommended scope will cover "warm air heaters, of 200,000 Btu output and above, which are factory assembled and fire-tested, suitable for use with oil, gas or a combination of fuels, consisting of a burner unit, heat exchangers, blower section, casing and controls. These heaters are suitable for use with ducts, discharge nozzles, grills or louvers, and filters."

Allied Research Acquired

Robert J. Huber, president of Michigan Chrome and Chemical Co., Detroit, has announced the acquisition of Allied Research & Engineering Co., Hollywood, Calif. Allied Research is said to be a leader in the new technology of electroforming.

Paul Harper, formerly West Coast District manager for the Chemical Div. of the parent company, has been promoted to general manager of Allied Research, which will operate as a wholly owned subsidiary.

Crucible Holds Technical Session

The Crucible Steel Co. of America held a plant tour and technical session for approximately 50 members of the press recently to demonstrate the first D-H vacuum treatment unit in America and discuss its importance to users of specialty steels.

Pressed Metal Institute Chicago May Meeting Held

More than 200 members of the stamping industry attended the May meeting of the Chicago Chapter of the Pressed Metal Institute, held May 23 at Nielsen's Restaurant, Elmwood Park, Ill., (Chicago suburb). Topic of the session was "New Press Room Devices."

Jefferson D. Keith, recently appointed managing director of PMI, opened the meeting, which featured several color films on stamping operations, including two made in Italy.

Several exhibitors were on hand to discuss roll feeds, straightening machines, hydraulic piercing units, centerless grinding fixtures and air feed units.

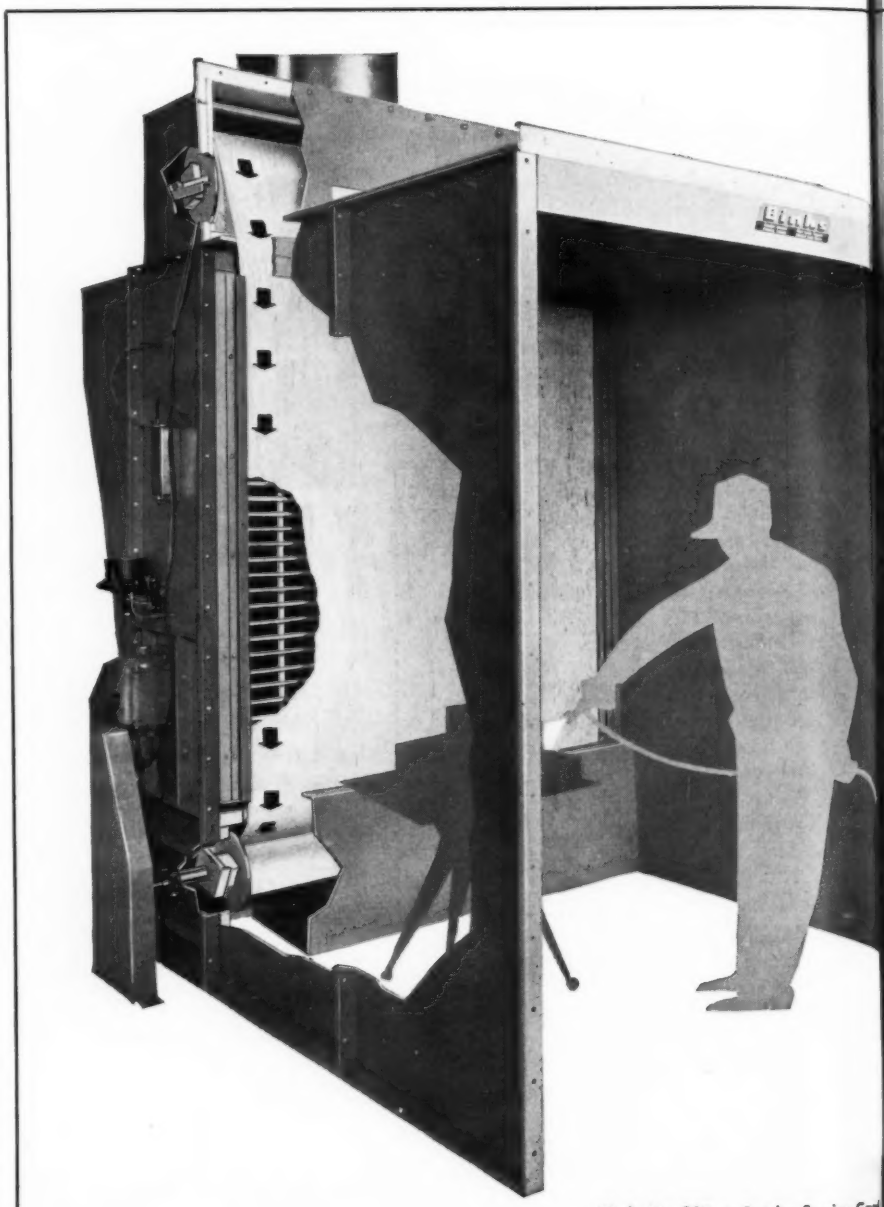
Juel M. Ranum Named Laundry Conference Head

The American Home Laundry Manufacturers' Association has announced that Juel M. Ranum, director of corporate and public affairs, Whirlpool, has been selected chairman of the 15th National Home Laundry Conference, Pick-Congress Hotel, Chicago, October 26-27.

Lux Clock Expands Plant in Tennessee

Present at the recent opening at Lux Clock Mfg. Co.'s new facilities at the Lebanon, Tenn. plant were (from left), William F. Cahill, secretary and treasurer; Paul Lux, executive vice president; Arthur Tanner, president; William D. Beard, Lt. Governor of Tennessee; and J. G. Atkinson, plant manager. The new facility encompasses 54,000 sq ft.

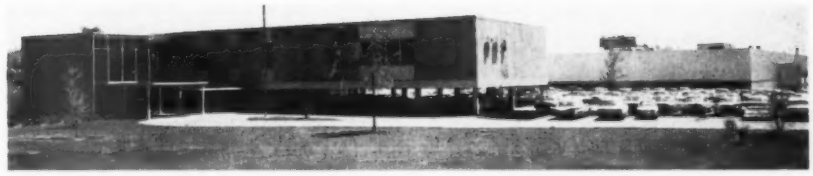
MPM PHOTO



Circle No. 306 on Reader Service Card

New Electric Tool Plant Opened

Portable Electric Tools, Inc., Geneva, Ill., recently dedicated a new plant and headquarters office building. The plant covers 210,000 sq ft on a 25-acre site, and includes complete die casting and electric motor manufacturing facilities for the firm's line of power tools for home and industry.



AHLMA Gives Life Memberships

Carl C. Daily and C. A. Brewer have been elected lifetime honorary members of the American Home Laundry Manufacturers' Association. Daily recently retired as sales manager of Firestone Industrial Products Div. of Firestone Tire & Rubber Co. He is a former chairman of the association's Associates Committee and has been an active member since his company joined AHLMA in 1940.

Brewer is manager of trade association relations for the Major Appliance Div. of General Electric. He is a former chairman of the association's Market Research Committee, and has been an active member of the committee.

New Binks Dispo Spray Booth has...

2250 sq. ft. of disposable "filters"

automatic curtain rolls away paint overspray

The secret of the new Binks Dispo Spray Booth is a 150-yard disposable curtain which collects paint overspray . . . approximately 150 gallons...that's 2250 sq. ft. of filtering!

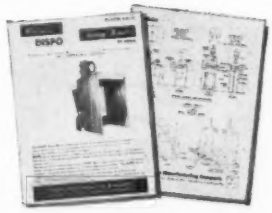
It's economical . . . a roll costs less than 2 cents per square foot...about 80% less than most paint filters cost.

It's safe...manufactured to meet NFPA fire standards...accepted by all major insuring companies.

It's automatic . . . when the curtain collects a pre-determined amount of overspray, a new section advances automatically.

It's simple...one man can change a roll in 5 minutes.

Ask for Bulletins A-27-14 & 15 for complete details. Your Binks Distributor has copies, or write to the address below.



Ask about our spray painting school. Open to all . . . NO TUITION . . . covers all phases.

Binks Manufacturing Company 3126 Carroll Avenue, Chicago 12, Ill.

REPRESENTATIVES IN PRINCIPAL U.S. & CANADIAN CITIES • SEE YOUR CLASSIFIED DIRECTORY

1238

Binks | Everything for spray painting

Rheem Board of Directors Elects Menzies, Sullivan

Duncan C. Menzies and Mark R. Sullivan were elected to the board of directors of Rheem Mfg. Co. at a recent meeting of the board in Chicago.

Menzies is president and a director of Servel, Inc. Sullivan, former president for 13 years of The Pacific Telephone and Telegraph Co., is a director of Pacific Telephone, California Packing Co., Wells-Fargo American Trust Co., and New York Life Insurance Co.

A. Lightfoot Walker, Rheem president, said the two new directors bring membership of the board to 11.

Hotpoint Reports "Coppertone" Refrigerator Finish a Top Seller

During a recent visit to Hotpoint's new Kitchen Planning Center in Chicago, an MPM editor was given a complete rundown on the company's refrigerator line by Howard Scaife, marketing — refrigeration department. Noting a continuation of a complete line of colors, Scaife was questioned concerning the present trend in color sales and the relative popularity of the colors offered. The report is that colored refrigerators are now up to about 20 percent of total production.

Headliner in the color parade is Hotpoint's "Fashion Finish," which has been commonly termed "Coppertone" throughout the appliance field. This new Fashion Finish is available not only on refrigerators but also on dishwashers and ranges, for a complete color coordinated kitchen assembly.

Finishing Equipment Firm Formed

A new firm specializing in industrial finishing equipment has been formed by Wallace Herdlein. Known as Wallace Herdlein & Associates, Inc., the Chicago-based firm is specializing in designing, engineering and manufacturing of metal cleaning, paint finishing and air handling systems, plant layouts for such systems, and ovens of all types.

Herdlein, formerly vice president and general manager of the Industrial Fin-

TO PAGE 77 →

LOW TEMPERATURE PORCELAIN ENAMELS

no sacrifice of CHAIN SPEED OR QUALITY

Ing-Rich has done it . . . again

We have developed Frit formulations which are giving highly satisfactory low temperature enameling results without sacrifice of chain speed or quality—in ground and cover coats both adaptable to color.

We can bring you definite proof of these satisfactory results.

We would like to point out that here again Ing-Rich proves the tremendous value To Our Frit customers of that rare combination of scientific approach . . . Plus . . . practical, technical Know-How.

Pioneer Producer of
LIFETIME
Porcelain Enamel Products

INGRAM-RICHARDSON, INC.
OFFICES, LABORATORY AND PLANT
FRANKFORT, INDIANA

ING-RICH
FRIT
"The Plant Tested Frit"

Circle No. 325 on Reader Service Card.

industry meetings

NATIONAL

HOUSEWARES

The National Housewares Manufacturers Association's National Housewares Exhibit, McCormick Place, Chicago, Ill., July 10-14, 1961.

MAINTENANCE & ENGINEERING

Western Plant Maintenance & Engineering Show, Pan Pacific Auditorium, Los Angeles, Calif., July 18-20, 1961.

PORCELAIN ENAMEL

The American Ceramic Society, Inc.'s Divisional Fall Meeting on Enamel, French Lick-Sheraton Hotel, French Lick, Ind., September 20-23, 1961.

WELDING

The American Welding Society's Fall Meeting, Adolphus Hotel, Dallas, Texas, September 25-28, 1961.

SECTIONAL

PLASTICS CONFERENCE

Society of Plastics Engineers, Inc.'s Regional Technical Conference, Sponsored by the Central Indiana Section, Severin Hotel, Indianapolis, Ind., September 12, 1961.

Industry news

→ FROM PAGE 75

ishing Equipment Div. of The R. C. Mahon Co., said manufacturing operations are currently being sub-contracted, but that several plant sites in the Midwest are now under study.

Joining Herdlein are L. H. McCain and Robert K. Baker. McCain had been manager of Mahon's regional sales and engineering offices in Chicago, and Baker was Herdlein's assistant. Oscar Stiska is secretary of the new organization.

Hibler Named Council Head

The Manufacturing Engineering Council has elected Harry C. Hibler its new national president. Hibler, manager of manufacturing engineering for Designers for Industry, Inc., replaces Frederick I. Ellin, chief production engineer for Ohmite Mfg. Co., Chicago.

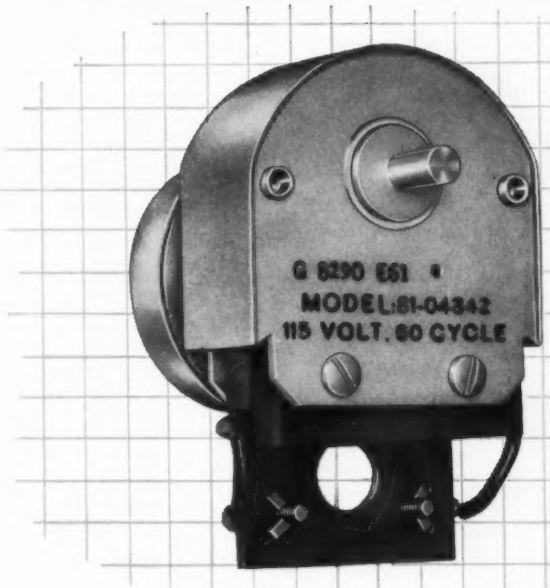
The Council, with executive offices in Cleveland, is a national professional society for key management and engineering personnel in manufacturing.

Midwest Gas Engineers Install 1961 Officers

The Midwest Chapter of the Gas Appliance Engineers Society has announced the installation of officers for the current year. Elected were William H. Patrick,

TO PAGE 82 →

DESIGNED FOR ECONOMICAL PROCESS CONTROL



MODEL 81
For mounting at rear of customer's panel.

hagen single circuit motor reset timers

This Timer is used for controlling a process or series of processes to be operated for a selected interval and then shut off automatically.

Timing starts when an external contact is closed and remains closed for the duration of the cycle. Should power fail, the timer resets to starting position and begins a new cycle when power is restored.

Unique mounting of Reset Spring provides uniform tension over the entire timing scale, thus insuring long spring life and better motor performance.

MODEL 81
With dial and pointer

Timers equipped with an over-ride, slip-clutch assembly to further protect the motor when timers remain in a "timed-out" position with the motor coil energized.

The Model 81 has an adjustable time setting and is available with calibrated dial and time-set pointer or without dial and pointer (as shown at top) for mounting at rear of customer's panel.

STANDARD TIMER RANGES

Time Range	Dial Divisions	Reset Time
0-4 Seconds	¼ Sec.	½ Sec.
0-15 Seconds	1 Sec.	½ Sec.
0-60 Seconds	5 Sec.	1 Sec.
0-3 Minutes	15 Sec.	5 Sec.
0-5 Minutes	15 Sec.	10 Sec.

CONTACT RATING
15 Ampere 125/250 v.a.c.

DIAL SPREAD
225 Degrees

Write for Bulletin 1610 describing the HAGEN line of Single Circuit Motor Reset Timers

BLISS
HAGEN MANUFACTURING DIVISION / BARABOO, WISCONSIN
Of The Gamewell Company
AN E. W. BLISS COMPANY SUBSIDIARY

Circle No. 321 on Reader Service Card.

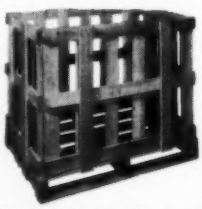
in CHICAGO MILL

MATERIALS HANDLING CONTAINERS

Save time . . . money . . . labor . . . storage space. Chicago Mill materials handling containers provide faster . . . easier . . . safer means of moving, containing and storing bulk materials!

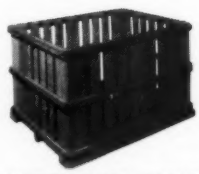
WRITE FOR FREE ILLUSTRATED BROCHURE!

WOODSTEEL BOXES
Nesting and Square Types

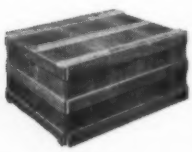


HINGED CORNER MATS
Collapsible Type

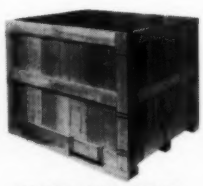
UNIT PACKS
Re-usable and Palletized



WIREBOUND PALLET BOXES
Re-usable and Expendable

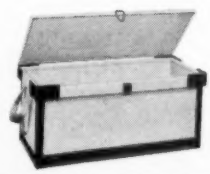


HINGED CORNER CONTAINERS
Collapsible and Re-usable



KLIMP FASTENED CONTAINERS
Strong, Tremendous Capacity, Re-usable

STEEL STRAPPED CONTAINERS
For the Heaviest Loads



HINGED LID CONTAINERS
Steel Reinforced

CHICAGO MILL AND LUMBER COMPANY
33 South Clark Street Chicago 3, Illinois

PLANTS
- CHICAGO, ILLINOIS
- GREENVILLE, MISSISSIPPI
- HELENA, ARKANSAS
- ROCKMART, GEORGIA
- TALLULAH, LOUISIANA
- CHERAW, S. CAROLINA

Circle No. 309 on Reader Service Card.

safe transit

editorial voice of the national safe transit program

COPYRIGHT 1961
DANA CHASE PUBLICATIONS, INC.

Devoted to improving packaging, shipping, and materials handling methods for the appliance and metal products manufacturing industries. This section contains information on plant experience and industry advances for improving packaging and shipping methods, and prevention of in-transit loss. It also contains information on the National Safe Transit Committee's preshipmet testing program and reports on NST activities.

Preventive Maintenance Theme of Conference-Workshop

Five moderators are scheduled to lead discussion groups on five phases of preventive maintenance for packaging machinery in the Workshop program of the technical meetings that will be held concurrently with the Packaging Machinery Manufacturers Institute Show of 1961. Sponsored by PMMI, the Conference-Workshop is to be held in Cobo Hall. Detroit, from 9:30 AM to noon, November 8-9, 1961.

Participation in the Workshop is gained by the same badge that provides admission to the Packaging Machinery Manufacturers Institute Show. The PMMI Show is scheduled for November 7-10.

Union Steel and Banner Metals Appoint Representatives

Union Steel Products Co., Albion, Mich., and Banner Metals, Inc., Compton, Calif., recently announced their joint appointment of the Stanley E. Morris Co., 5584 Alhambra Ave., Los Angeles 32, Calif. as their Southern California representatives for the sales of USP Palletainers and other allied materials handling containers and equipment.

USP Palletainers are now manufactured on the West Coast by Banner Metals.

"All manufacturing, engineering, and quality efforts are in vain if the product reaches its destination in a damaged condition."

"Reach Fork" Lift Truck

Forty specification changes have been made in a new model narrow aisle electric "Reach Fork" truck introduced by The Raymond Corp. A new high pressure hydraulic system allows smaller rams to be used and increases lifting speeds. Compact nested mast sections and safety glass guard provide visibility.

The redesigned carriage is 12 in. lower to allow ceiling high stacking and 1½ in. shorter for easier narrow aisle operation.

"Reach Fork" Bulletin #842 is available describing the changes in the model.

Circle No. 225 on Reader Service Card.

Short Course in Plant Layout, Material Handling, Shipping

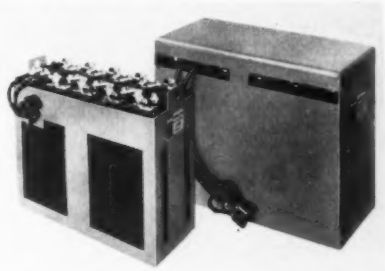
A one-week Short Course in Plant Layout, Material Handling, Warehousing and Shipping, presented annually by the Departments of Engineering and Engineering Extension, University of California, Los Angles, has been scheduled for September 17-22 at the Lake Arrowhead Conference Center in the San Bernardino Mountains.

Initiated in 1959, the Short Course provides a concentrated lecture, seminar and workshop program for management and supervisory personnel from all industry and business, military and commercial, who have the responsibility for initiating and directing plant layout, material handling, warehousing and shipping activities. Registration, open to men and firms from any area of the U.S., is limited in total number to insure full opportunity for individual participation.

Fee for the Short Course is $125, which includes board and room for the entire week. A complete program and additional information is available by writing to Dr. Sam Houston, Department K, University Extension, University of California, Los Angeles 24.

Lifetime Batteries for Material Handling Hand Trucks

Users of low-lift electric hand trucks no longer need to replace storage batteries during the entire service lives of such trucks, according to the Exide Industrial Marketing Div., The Electric Storage Battery Co. The division now guarantees owners of trucks equipped with the new Exide Nickel-Iron Alkaline batteries at least 80 percent of rated



battery electrical capacity in one-cycle-per-day service for the lifetime of these hand trucks. The only provison, even if the multi-purpose trucks last 20 years or more, as many of them do, is that users charge and maintain the batteries properly with approved equipment.

Circle No. 226 on Reader Service Card.

Automatic Strapping Machines

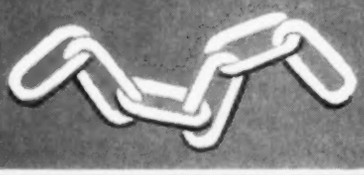
"Avistrapper" automatic strapping machines, manufactured by American Viscose Corp., come in two models, AVM-1 and AVM-2, and are for use with "Avistrap" cord strapping. Model AVM-1 is designed for smaller strapping applications, and Model AVM-2 automati-

cally straps larger cartons and packages. Both units are powered by ½ hp, 1200 rpm, 115 volt, 60 cycle motors.

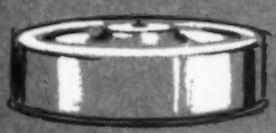
The firm also manufactures mechanized pneumatic tensioners, a full line of new and improved hand tools, and new dispensers for Avistrap.

Circle No. 227 on Reader Service Card.

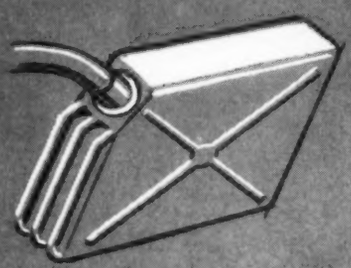
- Used as a water soluble quench for induction hardening.



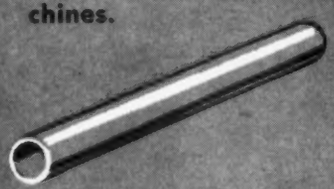
- Used as an additive to soluble cutting oil and soluble grinding oil emulsions to increase rust protective properties.



- Used as a transparent emulsion for hydrostatic testing.



- Used for lubrication and rust prevention on tube rolling machines.



- Used as a rust preventive in the rinse stage of spray type washers.

MACCO #1961

A new MULTI-FUNCTION RUST PREVENTIVE AND LUBRICANT

you can WELD, BRAZE, FABRICATE, ASSEMBLE, PAINT *right over it*

Better check into MACCO #1961 right now if you are not already familiar with it. Here's a newly developed, multi-purpose water soluble RUST PREVENTIVE that does so many jobs so well, and so economically. You can use less concentration, and it lasts longer. Leaves a film of protection you can work over without further cleaning, and paint over, too. If Rust Prevention for between operations or for storage is part of your operating procedure, then MACCO #1961 is for YOU!

Try it! You'll convince yourself!

THE METALWORKING INDUSTRY LOOKS TO MACCO FOR LEADERSHIP

CLEANING COMPOUNDS
CUTTING LUBRICANTS

DRAWING COMPOUNDS
RUST PREVENTIVES
FORGING COMPOUNDS
EXTRUSION LUBRICANTS

MACCO PRODUCTS COMPANY

FOR THE METALWORKING TRADE SINCE 1931

CHEMICAL COMPOUNDS

9207 mp S. SANGAMON ST., CHICAGO 20, ILLINOIS
PRESCOTT 9-0800

Circle No. 331 on Reader Service Card.

THERMOSETTING ACRYLICS: A FOLLOWUP

super nubelite

. . . THE GLIDDEN COMPANY

EDITOR'S NOTE: A great deal of interest was generated by the publication of "A Look at Thermosetting Acrylic Finishes" in the May issue of MPM. To round out the coverage of this important topic, the editors decided to publish a description of The Glidden Co.'s product which was not included in the original article.

WHILE BAKING PIGMENTED ACRYLIC FINISHES have been supplied and used in production finishing of appliances since prior to World War II, it was not until August 1958 that Glidden Super Nubelite was first used in production finishing of appliances.

Super Nubelite, Glidden's thermosetting acrylic finish, is now in volume production as (a) a gray flowcoat primer on laundry appliances; (b) white and colored enamels used over flowcoat primer and over flowcoat Super Nubelite primers on laundry appliances; (c) one-coat enamels on domestic refrigerators and freezers; (d) a one-coat enamel on fluorescent lighting fixtures; and (e) a one-coat clear coating on builders' hardware.

Glidden reports that the question "Why use acrylics?" has been asked by paint users as well as Glidden chemists and engineers. The company feels that the only answer to date is: "Use acrylics when laboratory tests, production runs and field service tests show that the desired performance and costs are better obtained with acrylics than with other compositions."

Glidden says that thermosetting acrylics are not the panacea of quality industrial finishing, and that in some cases finish specifications are better met by non-acrylic materials than by acrylic materials.

Super Nubelite finishes are specifically formulated for each plant in which they are used. Three chemically different lines of resins are required to produce the optimum properties for the present uses described.—MPM

Industry news

→ FROM PAGE 77

Plastics Look for Gain in Appliances

William P. Gobeille, manager of American Motors Corp.'s plastics division, told the Society of Plastics Industry at their New York convention that recent developments by the plastics and major appliance industries could lead to doubling the material used in household refrigerators.

Gobeille said the average refrigerator in the most popular sizes uses 25 pounds of plastics. "If the cabinet liners and foam insulation that are now in the pioneer stages of use could be successfully and economically adapted to these models, the amount of plastics in the average refrigerator would be doubled," he said.

"Improved or additional plastic parts can be used somewhere in every major appliance, such as agitators in automatic washers, gasketing materials in ranges, ductwork in clothes dryers, fronts on room air conditioners, and outer doors on refrigerators," Gobeille stated.

RUGGED HEAVY DUTY LEGS
for Vending Machines, Appliances and Other Heavy Equipment

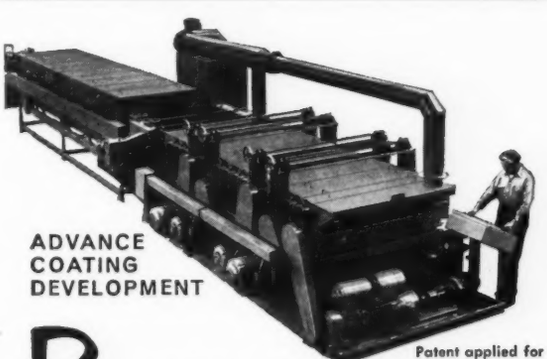
These legs are only a few of the many Heavy Duty Legs designed and manufactured by Wilkenson for Vending Machines, Appliances, Store and Restaurant Fixtures, Kitchen Cabinets, Metal Desks, etc.

Unlike similar legs on the market, these legs are so rugged that they withstand far greater stress and impact than they will ever receive in normal use. Quality-built throughout, they are available in a large variety of sizes and finishes.

WRITE TODAY for further information about our Heavy Duty Legs.

WILKENSON MFG. CO.
2916 W. Lake St. Chicago 12

Circle No. 351 on Reader Service Card.



ADVANCE COATING DEVELOPMENT

Patent applied for

Proven IN PRODUCTION

The New Roth SIMPLIFIED coating lines mark another advancement for consistent quality drawing. Here is the answer to a highly economical and automated application for dry type drawing lubricants. This fresh approach to an integrated line reflects a 20-year tradition for progressive cost saving production.

- Revolutionary new brush-coater
- High conveyor speeds
- Heavy-duty design
- Minimum floor space

INVESTIGATE THE COMPLETE ROTH LINE NOW!

ROTH corporation
LORAIN, OHIO

Circle No. 344 on Reader Service Card.

ADVERTISERS' INDEX

	PAGE
ALAN WOOD STEEL CO.	38
ALLIED RESEARCH PRODUCTS, INC.	19
AMERICAN PORCELAIN ENAMEL CO.	52
ARMCO STEEL CORP.	1
BETHLEHEM STEEL CO.	4 & 5
BINKS MFG. CO.	74 & 75
BREVEL PRODUCTS CORP.	71
CAMLOC FASTENER CORP.	14
CHICAGO MILL & LUMBER CO.	78
CHICAGO VITREOUS CORP.	6
CLEARING DIV., U. S. INDUSTRIES, INC.	2ND COVER
COOK PAINT & VARNISH CO.	68
COWLES CHEMICAL CO.	50
DOLE VALVE CO.	4TH COVER
FERRO CORP.	12 & 60
GENERAL BEARING CO.	13
GENERAL INDUSTRIES CO., THE	45
GOODRICH CHEMICAL CO., B. F.	26
GRAY CO., INC., THE	69
HAGEN MFG. CO., DIV. EAGLE SIGNAL CORP.	77
HARRINGTON & KING PERFORATING CO., INC., THE	20
HOMMEL CO., THE O.	66
INDUSTRIAL DEVICES, INC.	69
INGRAM-RICHARDSON, INC.	76
INTERCHEMICAL CORP., FINISHES DIV.	22
INTERNATIONAL NICKEL CO., INC., THE	28
KERNS UNITED CORP.	2
LOCKFORMER CO.	11
LUX CLOCK MFG. CO.	72
MACCO PRODUCTS CO.	80
MACDERMID, INC.	44
MARSCO MFG. CO.	21
METAL PRODUCTS MANUFACTURING	69
METALS & CONTROLS, INC., SUBS. OF TEXAS INSTRUMENTS, INC.	54
MICHIGAN OVEN CO.	8 & 9
MILLS PRODUCTS, INC.	39-42
OAKITE PRODUCTS, INC.	23
OLIN MATHIESON CHEMICAL CORP., METALS DIV.	18
PEMCO CORP.	15
PRE FINISH METALS, INC.	73
PYRAMID MOULDINGS, INC.	37
QUAKER STATE METALS CO.	10
RANSBURG ELECTRO-COATING CORP.	55
ROTH CORP.	81
SAMUEL STAMPING & ENAMELING CO.	69
STILL-MAN MFG. CORP.	58
THERMAC CO.	62
TUTTLE ELECTRIC PRODUCTS, INC.	59
UNION STEEL PRODUCTS CO.	3RD COVER
UNITED SHOE MACHINERY CORP., FASTENER DIV.	70
WALL TUBE & METAL PRODUCTS CO.	27
WILKENSON MFG. CO.	81
WYANDOTTE CHEMICALS CORP.	56

CUSTOMER SERVICE OFFICES

DANA CHASE, JR., York St. at Park Ave., Elmhurst, Ill. ..... TErrace 4-5280
R. F. KENDIG, York St. at Park Ave., Elmhurst, Ill. ..... TErrace 4-5280
KARL J. SHULL, 608 Midvale, Los Angeles 24, Calif. ..... GRanite 7-8824 and WEbster 1-3030
RUSSELL W. MADDOX, 255 Hippodrome Bldg., Cleveland 15, Ohio ..... SUperior 1-2062
WILLIAM S. HAYES, 17 E. 48th St., New York 17, N. Y. ..... PLaza 2-3764

CLASSIFIED

FOR SALE

2 — Oil fired Ferro porcelain enameling ovens; 1 — 5'0" x 30" x 12'0"; 1 — 5'0" x 60" x 12'0". Complete — in excellent condition. **The Fischman Co., 10th & Allegheny Ave., Philadelphia, Pa.**

Cleaning Home Air

→ FROM PAGE 47

electronic cell, which is necessary every two to four months under normal conditions. The kit includes a wash rack and tub, a splash shield, a detergent squeeze bottle, detergent, a hose and a special nozzle. After the cell is replaced in the cabinet, an automatic timer keeps power off and the system fan on for 3½ hours to insure complete drying.

Optional feature

Also available as an optional feature is a 2-in. collecting section for heating plants with higher cfm ratings or air conditioning units of larger capacity. With the addition of the 2-in. collecting section, the air cleaner will deliver top performance in units up to 2200 cfm and air conditioners up to 5½ tons.

Industry News

→ FROM PAGE 77

president; Willard E. Kendall, vice president; Paul F. Nesse, secretary; D. D. Dennis, treasurer; Robert Lunoe, one-year trustee; D. Culligan, two-year trustee; and W. F. Bohn, three-year trustee.

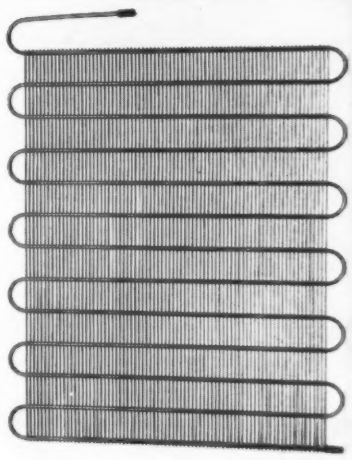
The society is composed of engineers and sales engineers connected with the gas appliance industry. Persons interested in membership information may write W. E. Kendall, chairman, new membership committee, Aero-Matic Engineering Co., Inc., Merchandise Mart, Chicago 54, Ill.

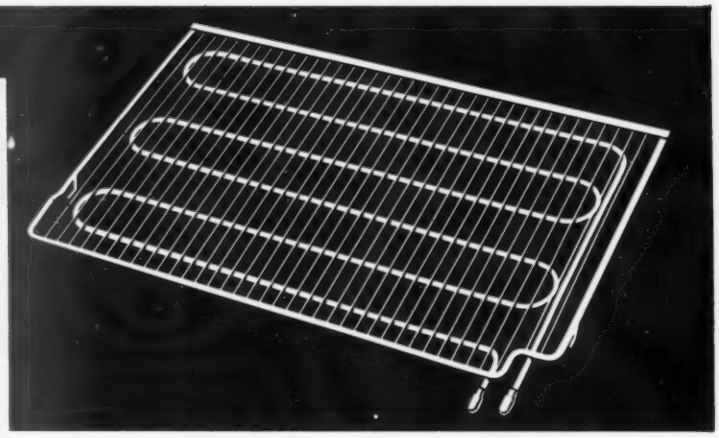
Japan Leads Trade Fair

Japan, with 14,000 sq ft of exhibit space, will be the largest national exhibitor at the 1961 Chicago International Trade Fair. The Fair will be held July 25 through August 10 in McCormick Place.

Among the products which will be exhibited by 80 Japanese companies are electronics and electric equipment, hardware, housewares, machinery, tools and toys.

MORE EFFICIENCY ECONOMY EYE APPEAL with USP





USP Condensers—also of the resistance welded, wire and tube type are providing refrigerator and freezer manufacturers with new application versatilities. Like Unifreeze shelves, USP Condensers are available to match your own equipment requirements.

Modern, Distinctive Unifreeze Shelves . . .

Another USP first! . . . Designed to surpass the exacting competitive standards of the day, Union Steel's Unifreeze evaporator shelves offer more efficiency, economy and eye appeal. They provide the permanent beauty, simplicity of installation and peak performance efficiencies. Their unique wire and tube type design permits the *maximum* conduction and convection of heat as well as a faster "pull down" factor than ordinary evaporator type shelving. Then too, Unifreeze shelves are rugged and rigid. Their sparkling clean, attractive wire and tube construction is in complete harmony with modern freezer design. Unifreeze shelves are easier to clean or defrost and they're engineered and manufactured in any practical size, shape or capacity and finish to suit your needs.

If it's made of Wire . . . you can get it from Union Steel

Whatever your wire parts problem, you'll get real help from Union Steel. You'll get the benefit of more than fifty years of experience and leadership in the design and fabrication of better, more dependable wire products. You'll also get the cooperation of USP's design engineers, plus the assurance of quality materials in the hands of skilled craftsmen. This, plus the protection of USP quality control with 100% inspection.

Why not let USP assist you in planning and producing a wire part or product that will make *your product* more efficient.

UNION STEEL PRODUCTS CO.
ALBION, MICHIGAN

Gentlemen:—Please have your representative contact us at once.

*Name*_____

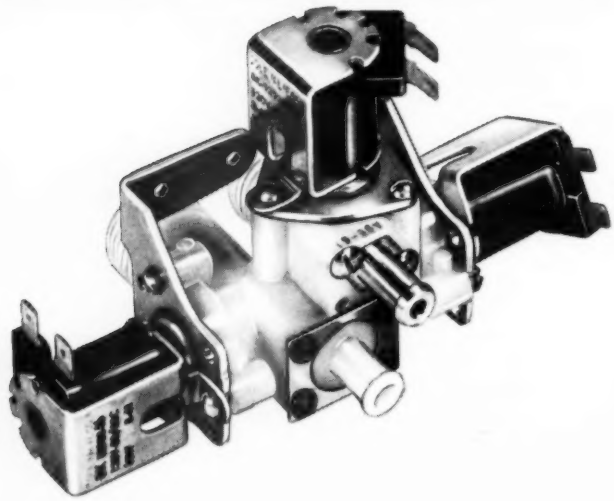
*Company*_____

*Address*_____

*City*_____ *Zone*____ *State*_____

Circle No. 349 on Reader Service Card.

ANOTHER HOME LAUNDRY VALVE REFINEMENT SPECIALLY ENGINEERED BY DOLE



A special solenoid operated washer-dryer combination mixing valve with a precise flow through an auxiliary outlet for a wash-out dispenser was required by a leading manufacturer of home laundry equipment. At the time no valves available to the industry gave the performance required.

Dole engineers redesigned the basic Dole N-23 three solenoid valve, making precision refinements in the valve coring and auxiliary outlet areas and adding special inlet flow controls. The result is a valve with the desired flow for wash and rinse cycles and a very low pressure drop on the flow through the auxiliary outlet to provide sufficient water at the proper velocity for the dispensing function.

In addition to providing a basic valve to meet every known requirement in the appliance industry, Dole engineering flexibility and manufacturing experience are available for the development of special applications and new designs to provide the most economical solutions to special problems.

Complete information about Dole valves or Dole engineering service is yours for the asking. Write: The Dole Valve Company, 6201 Oakton St., Morton Grove, Illinois

Control with

DOLE®

APPLIANCE CONTROLS SALES DEPARTMENT
The Dole Valve Company
6201 Oakton Street, Morton Grove, Illinois
DOLE VALVE COMPANY OF CANADA, LTD.
Box 428, Oakville, Ontario

© Dole Copyright, 1961